

EAST AFRICA PROTECTORATE.

ANNUAL MEDICAL REPORT

FOR THE

YEAR ENDING 31ST DECEMBER, 1918.

No. 16/572/57.

MEDICAL DEPARTMENT,
HEAD OFFICES,
NAIROBI,

15th September, 1919.

SIR,

I HAVE the honour to submit, for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State, the Medical Report on the health and sanitary condition of the East Africa Protectorate for the year 1918, together with the Returns, &c., appended thereto.

I have the honour to be,

SIR,

Your obedient servant,

A. D. MILNE,

Principal Medical Officer,

East Africa Protectorate.

The Honourable,

The Chief Secretary,

Nairobi.



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I.—ADMINISTRATION.

SECTION I.—DEPARTMENTAL.

1.—ESTABLISHMENT.

The Medical Staff of the Protectorate as sanctioned for the year 1918-19 was as follows :—

ADMINISTRATIVE DIVISION.

Principal Medical Officer	...	...	...	1
Deputy Principal Medical Officer	...	...	...	1
Office Superintendent	...	...	...	1
European Clerks	...	...	...	2
3rd Grade Clerks	...	...	...	2
4th Grade Clerks	...	...	...	5
Medical Storekeeper	...	...	...	1
Issuer of Medical Stores	...	...	...	1
Messengers and Packers	...	...	...	12

MEDICAL DIVISION.

Senior Medical Officers	...	...	...	2
Medical Officers	...	...	...	23
District Surgeon	...	...	...	1
European Dispensers	...	...	...	4
Matron	...	...	...	1
Nursing Sisters	...	...	...	11
Superintendent, Lunatic Asylum	...	...	...	1
Warders, Lunatic Asylum	...	...	...	2
Matron, Lunatic Asylum	...	...	...	1
Assistant Matron, Lunatic Asylum	...	...	...	1
Assistant Surgeons	...	...	...	7
Sub-Assistant Surgeons	...	...	...	45
Compounders	...	...	...	15
Native Hospital Attendants, &c....	...	...	(as necessary)	
Lunatic Asylum Attendants	...	...	(as necessary)	

SANITATION DIVISION.

Principal Sanitation Officer	...	...	...	1
Medical Officers of Health	...	...	...	13
Sanitary Inspectors...	...	...	...	14
Nurses	...	...	...	2
Assistant Surgeons	...	...	...	6
Sub-Assistant Surgeons	...	...	...	7
Chief Vaccinator	...	...	...	1
Vaccinators	...	...	...	56
European Clerk	...	...	...	1
3rd Grade Clerk	...	...	...	1
4th Grade Clerks	...	...	...	8
5th Grade Clerk	...	...	...	1
Compounders	...	...	...	3
Mechanics for Clayton Disinfectors	...	...	...	4
Native Hospital Attendants, &c....	...	...	(as necessary)	

2.—APPOINTMENTS. — 12

The following appointments were made during the year :—

NURSING SISTER.

Miss P. R. di Menna, 11th January, 1918.

ASSISTANT MATRON, LUNATIC ASYLUM.

Miss D. Godden, 7th November, 1918.

EUROPEAN CLERK.

Mr. J. D. Nightingale, 8th March, 1918.

DISPENSER.

Mr. F. Cribb, 8th March, 1918.

SANITARY INSPECTOR.

Mr. E. Holness, 16th December, 1918.

SUB-ASSISTANT SURGEON.

Mr. Gunpatram Patel, 2nd August, 1918.

COMPOUNDERS.

Mr. A. D. Acharya, 17th February, 1918.

„ M. M. Patel, 2nd April, 1918.

„ C. A. D'Silva, 13th August, 1918.

„ M. A. S. Rodrigues, 18th December, 1918.

„ P. T. Bhatt, 28th December, 1918.

CLERKS.

Mr. C. C. D'Souza, 5th February, 1918.

„ D. M. Nunes, 1st April, 1918.

„ A. F. D'Souza, 6th December, 1918.

„ A. R. Valles, 18th December, 1918.

3.—REDUCTIONS IN STAFF.

DEATHS.

Dr. R. W. Spence, 19th May, 1918.

„ B. W. Cherrett, 4th November, 1918.

„ J. M. O'Connell, 7th November, 1918 (seconded from W.A.M.S.).

Assistant Surgeon A. A. Parpia, 7th January, 1918.

„ „ D. E. Barrett, 8th October, 1918.

Compounder Ali Azfar, 26th October, 1918.

„ M. M. Patel, 11th November, 1918.

INVALIDED.

Dr. R. Small, 3rd December, 1918.

Nursing Sister, Miss R. S. Blyth, 9th March, 1918.

Sub-Assistant Surgeon Fazl Karim, 29th March, 1918.

„ „ K. R. Diwan, 18th August, 1918.

„ „ Waryam Singh, 29th September, 1918.

Store Issuer Sunt Singh, 3rd October, 1918.

RESIGNATIONS, &c.

Dr. J. M. Clark, W.A.M.S., 19th April, 1918 (transferred to conquered territory G.E.A.).

Nursing Sister Miss I. L. Majendie, resigned 10th April, 1918.

„ „ „ R. Paul, resigned 22nd November, 1918.

Dispenser F. Knott, resigned 7th October, 1918.

Sub-Assistant Surgeon Sant Ram, dismissed 24th January, 1918.

„ „ B. R. Kapur, resigned 31st July, 1918.

„ „ G. M. Patel, dismissed 31st Dec., 1918.

Compounder P. G. Johnson, absconded 24th June, 1918.

„ Zafar Yab Ali, discharged 3rd July, 1918.

Clerk A. J. Pereira, transferred 10th December, 1918.

„ R. D. Virji, transferred 8th February, 1918.

4.—LEAVE OF ABSENCE.

Name.	Appointment.	Period.	
		Departed.	Returned.
Dr. F. L. Henderson ...	Medical Officer	1st May, 1918 ...	...
„ T. H. Massey ...	„	26th February, 1918	...
„ P. F. Nunan ...	„	21st September, 1918	...
„ R. Small ...	Medical Officer of Health	9th March, 1918 ...	3rd December, 1918.
„ P. A. Clearkin ...	Medical Officer	10th January, 1918	10th July, 1918.
Mr. J. P. Cook ...	Sanitary Inspector ...	12th April, 1918 ...	6th July, 1918.
„ F. Strawbridge ...	„	19th October, 1918...	...
„ F. Knott... ..	Dispenser	11th April, 1918 ...	7th October, 1918.
Mrs. S. J. Harrison ...	Nursing Sister	30th May, 1918 ...	6th July, 1918.
Miss R. Paul	„	6th April, 1918 ...	2nd November, 1918.

5.—RESUMPTION OF DUTY FROM LEAVE GRANTED IN 1917.

Name.	Appointment.	Date.
Dr. A. D. Milne	Principal Medical Officer	2nd February, 1918.
„ J. Pugh	Medical Officer	2nd February, 1918.
Mr. B. E. F. Wetkin	Sanitary Inspector	30th April, 1918.
„ A. F. Dennett	„ „	30th April, 1918.
„ L. Merryweather	Nursing Sister	16th October, 1918.

6.—LEAVE.

OFFICERS ABSENT THROUGHOUT 1918.

The following Officers were absent throughout the year :—

Dr. T. F. Lumb, Medical Officer, seconded for military service in Europe.

Mr. T. Preston, Clerk, seconded for military service in Europe

7.—ADDITIONAL STAFF.

The undermentioned Officers of the West African Medical Service were attached temporarily for duty, for periods stated :—

Dr. H. F. Hamilton	...	...	1/1/18 to 31/12/18
„ J. E. Clark	...	...	1/1/18 „ 19/ 4/18
„ P. A. Clearkin	...	...	1/1/18 „ 31/12/18
„ J. M. O'Connell	...	...	1/1/18 „ 7/11/18

8.—STAFF POSTINGS THROUGHOUT THE YEAR.

THE COAST ZONE.

Dr. C. L. Chevallier, Senior Medical Officer, continued to act in this appointment throughout the year.

Dr. F. L. Henderson was in medical charge of the European Hospital, Mombasa, till May, when he proceeded home on leave and was succeeded by Dr. J. Pugh, who continued in charge for the remainder of the year.

Dr. J. O. Shircore was in medical charge of the Native Civil Hospital, Mombasa, during the whole year.

The European and Native Hospitals with their personnel reverted to civil status from the 3rd April and 3rd March respectively, and no longer received military patients from those dates.

Assistant Surgeon R. Holmes continued in medical charge at Lamu throughout the year.

THE MOUNTAINOUS ZONE.

Dr. J. L. Gilks was in medical charge of the European Hospital, Nairobi, during the year.

Dr. J. H. Thomson continued in medical charge of the Native Civil Hospital, Nairobi, and Lunatic Asylum during 1918.

Dr. R. W. Spence was in medical charge of Nakuru Hospital and Naivasha Province till May when he was succeeded by Dr. H. F. Hamilton, W.A.M.S., who was relieved in December by Dr. N. P. Jewell.

Dr. W. H. Heard was in medical charge of Eldoret till August, 1918, when he resigned.

THE KENIA AND NYANZA PROVINCES.

Dr. J. M. Clark, W.A.M.S., was in medical charge of Kisumu Hospital and Nyanza Province till April, when he was transferred to the conquered territory of G.E.A. for duty. He was succeeded by Dr. N. P. Jewell, who continued in charge till the middle of December, when he was relieved by Dr. Hamilton, W.A.M.S., on transfer to Nakuru.

Dr. J. M. O'Connell, W.A.M.S., continued in medical charge of Fort-Hall Hospital and Kenia Province (excepting Nyeri District) till November, when he died. He was succeeded by Assistant Surgeon A. N. Nyss.

Dr. H. R. A. Philip carried out the duties of District Surgeon, Nyeri, throughout the year.

THE DESERT ZONE.

Dr. G. R. H. Chell continued in medical charge of the Northern Frontier District till November, 1918, with headquarters at Moyale.

Dr. P. F. Nunan continued in medical charge of civil population and military detachment at Wajir till August, 1918. An officer of the R.A.M.C. was posted for duty with the military on the departure of Dr. Nunan.

Dr. E. Dias was Medical Officer at Kismayu from January till the beginning of December, when he resigned and was relieved by an officer of the R.A.M.C., who carried out military and civil duties at the station.

9.—MILITARY MEDICAL SERVICE.

A few members of the Department continued to render military service with the forces throughout the year.

SECTION II.—EXTRA DEPARTMENTAL.

10.—REGISTRATION OF MEDICAL PRACTITIONERS AND DENTISTS ORDINANCE.

The Ordinance governing registration came into force on the 24th September, 1910, since when and up to the end of the year the following have been placed on the Register :—

Registered Medical Practitioners	...	...	...	67
Licensed	...	...	...	6
Dentists	...	...	...	5

42 of the Medical Practitioners, including the Government Dental Surgeon, were in Government Service, and 36 were private practitioners.

During the year the following were admitted to the roll :—

Cowen, Charles E. L., L.M., R.C.P., L.L.M., R.C.S., Irel.
De Souza, Alex. C. L., L.M. and S., U. Bombay.

The Board convened for the purpose of the Ordinance consisted of :—

Dr. R. W. Burkitt,
,, C. L. Chevallier,
,, W. Owen-Prichard,
,, W. J. Radford,
,, J. A. Haran,

with the Principal Medical Officer as President and Registrar.

The Board held two meetings during the year.

11.—THE DRUGS AND POISONS ORDINANCE 1909.

This Ordinance controls the licensing of chemists and druggists, as well as the sale of poisons throughout the Protectorate.

Fifteen names have been placed on the register since the introduction of the Act to the end of 1918. Of these three were by examination.

The Board appointed under the Ordinance consisted of the following :—

Mr. L. A. Howse,
,, A. A. White,
,, V. H. Kirkham,
Dr. C. L. Chevallier,
,, W. J. Radford,
,, J. A. Haran,

with the Principal Medical Officer as President and Registrar.

No meetings were held during the year.

II.—PUBLIC HEALTH.

(a) GENERAL REMARKS.

THE PROTECTORATE.

The military situation in British East Africa during the year 1918 saw the reversion to civil jurisdiction of the last of the Protectorate Hospitals and the Base Medical Stores, leaving only a remnant of the civil medical headquarters staff to clear up the final demobilization of what was left of the East Africa Medical Service. As indicative of the difficulties connected with this work, it may be recalled that the first commencement towards demobilization was in October, 1916.

It may be said that the general health of all sections of the community, almost without exception, during the year, was exceptionally bad. There was a considerable addition to the number of cases treated, which, even allowing for the normal rise in attendance at hospitals consequent on the development of the country, was much above the average. The mortality was abnormal, due to a variety of explainable causes which could not be controlled. The effects of the year's work was further reflected in the increase of the invaliding rate amongst the official class. Stoppage of leave, the withdrawal of every available man, either from his billet here or who might have been selected to fill that post from home, resulted in the retention of an understaffed, overtaxed body of war-stale Government servants to carry on the administration of the country. While all departments suffered from the highest grade to the lowest, under the additional adverse conditions of high prices and famine conditions, it must be recorded that the burden of it all bore exceptionally heavy on the Medical Department. In the year one has to deplore as directly or indirectly attributable to war effects and the influenza scourge, the deaths of five medical officers, two assistant surgeons, one compounder, and the invaliding of two medical officers and one nursing sister, whose loss it has been exceedingly difficult to replace. Briefly, the conditions which so adversely affected the country were the universal drought throughout the greater part of the year due to the failure of both rains; the consequent famine conditions greatly stimulated the continued existence of the usual communicable diseases. It became apparent that the return of large numbers of discharged soldiers and carrier corps porters had and is having its inevitable effect on the country; this in spite of the most admirable efforts of the medical work of the carrier corps. It was not possible for the civil department to take over the segregation of disease "carriers." Thus it was that various diseases became especially prominent. The rapid spread of *tuberculosis* is becoming a serious menace. Equally with the rest of the world, this Protectorate was devastated by *influenza* which swept like a tidal wave to its very confines, practically exhausting itself after nine weeks. Generally speaking, the most noticeable thing about it was that its virulence was more deadly in the colder up-country regions than at the moister and hotter coast areas. One condition which the progress of medical work during the war has demonstrated very clearly is the enormous liability of the African to *helminthic* affections. Fully three-quarters of the native population is infected, and the question of *ankylostomiasis* alone must have a marked bearing on the labour market. In fact it is possible that the African lethargy inherent in this tropical region is largely dependent on this cause.

The total returns gave the following figures for the last three years :—

	Cases treated.			Deaths.
1918	122,643	2,030
1917	112,426	1,141
1916	116,522	1,093

The number of births and deaths amongst Europeans registered throughout the Protectorate during the year was :—

Births	...	...	...	...	...	140
Deaths	...	...	...	...	...	84

No census has been taken since 1911.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS IN THE EAST AFRICA PROTECTORATE.

	1916.	1917.	1918.
Total number of officials resident	993	968	909
Average number resident	820	703	691
Total number on sick list	582	427	679
Total number of days on sick list	6,270	3,725	7,042
Average daily number on sick list	17·13	10·20	19·29
Percentage of sick to average number resident...	2·09	1·45	2·79
Average number of days on sick list to each patient	10·77	8·72	10·37
Average sick time to each resident	6·31	3·84	7·74
Total number invalided	26	33	33
Percentage of invaliding to total residents	2·62	3·41	3·63
Total deaths	4	3	10
Percentage of deaths to total residents	·40	·31	1·10
Percentage of deaths to average number resident	·49	·42	1·44
Total number of cases of sickness contracted away from residence	—	—	—

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST NATIVE OFFICIALS IN THE EAST AFRICA PROTECTORATE.

	1916.	1917.	1918.
Total number of officials resident	1,923	2,017	1,999
Average number resident	1,628	1,617	1,614
Total number on sick list	3,791	3,343	4,755
Total number of days on sick list	12,676	25,214	33,563
Average daily number on sick list	34·63	69·07	91·95
Percentage of sick to average number resident	2·12	4·27	5·69
Average number of days on sick list to each patient	3·34	7·54	7·05
Average sick time to each resident	6·59	12·50	16·79
Total number invalided	22	18	63
Percentage of invaliding to total residents	1·14	·89	3·15
Total deaths	6	3	33
Percentage of deaths to total residents...	·31	·14	1·65
Percentage of deaths to average number resident	·36	·18	2·04
Number of cases of sickness contracted away from residence	—	—	—

I.—THE MOUNTAINOUS ZONE.

(i). GENERAL DISEASES.

Bronchitis and asthma were extremely common among Indians and natives. A large number of Indians are boarded each year owing to this cause. Invariably they say that they have no chest troubles before coming to this country. Functional disorders of the digestive system occasioned as usual a large number of entries. Hernia was common, and, in Kikuyu women, is thought to be a sign of beauty. Of nervous diseases, epilepsy was not infrequent, and every year occur two or three cases of hemiplegia or paraplegia in young adults.

The table of hospital admissions and deaths were as follows; showing a big increase in all classes :—

	In-patients.			Deaths.		
	1918.	1917.	1916.	1918.	1917.	1916.
European Officials	453	269	412	9	2	2
Native Officials	3,120	2,288	2,478	22	3	8
European General Population	246	207	767	21	12	11
Native General Population	6,959	4,811	3,864	1,048	637	512

(ii). COMMUNICABLE DISEASES.

MOSQUITO OR INSECT-BORNE.

Malaria.—Showed practically the same number of cases as last year. It must be remembered that 1918 was a year of small rainfall, and it would appear that the type of the disease was more virulent. Diagnosis at Nakuru and Nairobi was microscopic. Machakos reported a decrease of 40% compared with the previous year.

The table for the three years was as follows :—

	Cases.			Deaths.		
1918	4,499	...	...	22	...	...
1917	5,273	...	...	14	...	...
1916	6,144	...	...	7	...	...

Blackwater fever.—Of the cases recorded this year in the table below, one was a European, who died, the other deaths being natives :—

	Cases.			Deaths.		
1918	4	...	...	3	...	...
1917	8	...	...	2	...	...
1916	17	..	...	1	...	...

INFECTIOUS OR EPIDEMIC.

Cerebro-spinal meningitis.—All cases recorded were amongst natives :—

	Cases.			Deaths.		
1918	52	...	...	28	...	...
1917	297	...	...	191	...	...
1916	72	...	...	31	...	...

Dysentery.—Showed a very big increase. In the Naivasha province, practically all the cases recorded occurred in the town of Nakuru—580. The Medical Officer attributes this to the insanitary state of the township. Of

the total cases recorded 86 were Europeans, of whom four died. In Nairobi, the usual type of the disease was bacillary. Much of the trouble could be attributed to wrong feeding and starvation, owing to drought and the high price of crops ; contributory was a plague of flies in May, June and July.

Dr. Thomson considers that for the obstinate watery discharge after the acute symptoms are over, large doses, repeated one or twice, of Rhubarb with or without injections of *Bacillus coli* are useful :—

			Cases.			Deaths.
1918	...	...	2,969	...	...	236
1917	...	...	1,404	...	..	97
1916	...	...	2,168	...	...	138

Typhoid group.—Of the total number there were eight non-fatal cases of enteric amongst Europeans during the year :—

			Cases.			Deaths.
1918	...	...	17	...	...	2
1917	...	...	8	...	...	1
1916	...	...	34	...	...	3

Leprosy.—As compared with one new admission last year, there were eight cases and one death in 1918.

Plague.—Nakuru was the sole focus in the Zone, eight cases being recorded, of which five were fatal; one septicæmic case recovered. The possible cause of the outbreak was an Arab, who came from Kisumu. Last year there were 157 admissions, with 90 deaths.

Small-pox.—1,047 cases with 282 deaths, as compared with 99 cases and 15 deaths last year. Seven of these, one fatal, were Europeans. The mortality amongst native out-patients can never be ascertained with any degree of accuracy. The disease was prevalent in the Nairobi district.

Beri-beri.—As against two cases last year, there was a total of 40 cases this year, due to an influx of returned convicts from South Jubaland. The majority of the cases recovered.

Tetanus.—One case, not fatal, the same as last year.

Influenza.—The hospitals and dispensaries record a total of 6,350 cases, with 74 deaths; of this number 443, with 17 deaths, occurred amongst Europeans. Reference should be made to the Principal Sanitation Officer's report on its effect on the country.

Pneumonia.—951 cases, with 283 deaths, were recorded. Of these, 37 cases and four deaths were amongst Europeans.

Tuberculosis.—Dr. Thomson again draws attention to the spread of this disease, and bases his opinion on the following statistics furnished him by Captain Hollis, R.A.M.C., at the Carrier Corps Hospital, Nairobi, and by Captain Clark, R.A.M.C., at the Carrier Corps Hospital, Mombasa. The Mombasa figures are large, but as Captain Clark was Tuberculosis officer for Walsall, they may be taken as accurate. An analysis of 328 post-mortems performed in Nairobi, and 151 in Mombasa, gave the following results :—

				Mombasa	Nairobi.
Acute—lungs	...	...	...	47	32
Chronic became acute	...	...	...	—	12
Chronic filroid	...	...	...	—	2
Tabes mesenteric	...	...	...	4	2
Kidney	...	...	...	1	—
Spleen	...	...	...	1	—
Military	...	...	...	6	8
				59 = 39%	56 = 17%

If the average—28%—represents what is found on the post-mortem table what must be the proportion of those living in propagating the disease?

Venereal diseases.—The numbers treated for these affections were as follows :—

				In-patients.	Out-patients.
Syphilis	...	...	...	60	153
Gonorrhœa	...	...	...	56	221

Two deaths were recorded from syphilis.

The cases recorded as treated in 1917 were :—

Syphilis	...	...	...	372
Gonorrhœa	...	...	...	330

HELMINTHIC.

The classification of the cases of intestinal parasites treated during the year was as follows :—

				1918.	1917.
Cestoda	T. solium	...	...	144	62
	T. saginata	...	...	4	2
Nematoda	A. lumbricoides	...	...	25	20
	T. dispar	...	...	4	2
	A. duodenale	...	...	2	—
	O. vermicularis	...	...	5	5

The incidence of all cases for the three years was :—

1918	...	...	...	184
1917	...	...	...	93
1916	...	...	...	72

The increase evidences a more systematic examination of patients.

(b) EUROPEAN OFFICIALS.

The returns showed that the incidence of sickness was especially heavy during the year, and the death-rate abnormal owing to influenza :—

				In-patients.	Out-patients.
1918	...	...	453	...	236
1917	...	...	275	...	194
1916	...	...	419	...	225

There were nine deaths as against two in each of the preceding years. The causes were—influenza, 7 ; septicæmia, 1 ; Bright's disease, 1.

Influenza headed the list with 133 admissions, digestive troubles 71, malaria, 58 ; dysentery, 33 and respiratory diseases, 27.

The invalidings during the year were 17 as against 19 in 1917, and 12 in 1916. The causes were neurasthenia, anæmia, dysentery, mental (2 each) ; eye injury, alcoholism, eczema, debility, malaria, diseases of arteries, D.A. of heart, tuberculosis, necrosis of bone (1 each). Total, 17.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE MOUNTAINOUS
ZONE.

	1916.	1917.	1918.
Total number of officials resident	680	691	645
Average number resident	550	507	483
Total number on sick list	419	275	453
Total number of days on sick list	5,213	2,618	5,220
Average daily number on sick list	14·24	7·17	14·30
Percentage of sick to average number resident ...	2·59	1·41	2·96
Average number of days on sick list to each patient ...	12·44	9·52	11·52
Average sick time to each resident	7·67	3·78	8·15
Total number invalided	12	19	17
Percentage of invaliding to total residents	1·76	2·74	2·63
Total deaths	2	2	9
Percentage of deaths to total residents... ..	·29	·28	1·39
Percentage of deaths to average number resident ...	·36	·39	1·86
Total number of cases of sickness contracted away from residence	—	—	—

(c) **NATIVE OFFICIALS.**

The sick rate showed a notable increase, the comparison numbers being as follows :—

	In-patients.			Out-patients.		
1918	3,120	...	...	717	...	...
1917	2,308	...	...	595	...	...
1916	2,507	...	...	461	...	...

Malaria accounted for 922 cases, respiratory diseases 552, dysentery 174, and local injuries, 269.

There were 22 deaths during the year, in comparison with 3 in 1917, and 5 in 1916. These were accounted for by pneumonia (9), influenza (8), small-pox, bronchitis, broncho-pneumonia, disease of the digestive system, and nervous (1 each)=22.

Invalidings were 43 in all, and were occasioned by the following diseases :—

Malaria (8), tuberculosis (7), debility, bronchitis (5 each), rheumatism (4), asthma (3), mental, sciatica, cataract (2 each), syphilis, nephritis, eye affections, hæmoptysis of lung and influenza (1 each)=43.

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE MOUNTAINOUS
ZONE.

	1916.	1917.	1918.
Total number of officials resident	1,051	1,152	1,102
Average number resident	822	873	914
Total number on sick list	2,507	2,308	3,120
Total number of days on sick list	18,110	19,687	23,576
Average daily number on sick list	49·48	53·93	64·59
Percentage of sick to average number resident... ..	6·02	6·17	7·06
Average number of days on sick list to each patient ...	7·22	8·53	7·55
Average sick time to each resident	17·22	17·09	21·39
Total number invalided	12	13	43
Percentage of invaliding to total residents	1·14	1·12	3·90
Total deaths	5	3	22
Percentage of deaths to total residents... ..	·48	·25	1·99
Percentage of deaths to average number resident ...	·60	·34	2·41
Total number of cases of sickness contracted away from residence	—	—	—

(d) GENERAL EUROPEAN POPULATION.

The number of cases that came under review by the Government Medical Officers were about the same as last year, viz. :—

				In-patients.	Out-patients.
1918	...	...	...	246	1,028
1917	...	...	...	207	823
1916	...	...	...	767	1,151

The principal ailments were dysentery (43), enteric (7), influenza (285), malaria (124), pneumonia (33), and digestive (274).

Twenty-one deaths took place due to influenza (5), dysentery, pneumonia (4 each), blackwater fever, small-pox, tuberculosis, alcoholism, paralysis, hernia, bright's disease and tumour (1 each)=21.

The births and deaths registered were :—

				Births.	Deaths.
1918	...	...	...	111	72
1917	...	...	...	159	56
1916	...	...	...	137	48

(e) GENERAL NATIVE POPULATION.

The year reacted also amongst the native population very disastrously, much more so than the figures record. The comparison table showed :—

				In-patients.	Out-patients.
1918	...	...	...	6,959	36,086
1917	...	...	...	4,811	34,406
1916	...	...	...	3,864	36,699

Comparison table of deaths and death-rate to admissions :—

1918	...	...	...	1,048	15·05%
1917	...	...	...	637	13·24%
1916	...	...	...	512	13·25%

The chief causes of death were :—Small-pox (281), pneumonia (270), dysentery (232), influenza (54), nervous and mental (48), cerebro-spinal meningitis (28), digestive and malaria (22 each), injuries (26), leprosy and anthrax (1 each).

The principal causes of sickness were :—

Malaria (3,371), pneumonia (872), dysentery (2,709), influenza (5,044), and injuries (7,186).

Registration of births and deaths is not compulsory.

II.—THE COAST ZONE.**(a) GENERAL REMARKS.**

The Coast area showed also a big increase in the amount of sickness attributable in part to the closing down of the military hospitals.

(i). GENERAL DISEASES.

Dr. J. O. Shircore noted in his hospital that infective disease accounted for 54·4% of the admissions. Infections such as those causing bronchitis, conjunctivitis, cellulitis, enteritis, intestinal parasites (not including those concurrent with other diseases), and trauma, returned 15·5%, all of which may be regarded as, more or less, preventable. Of the remaining 30%, several of

the entries under the lymphatic, genito-urinary, locomotory and integumentary systems may also, if strictly examined, be attributable to infective processes.

Out-patients divided in the same manner give, for infective diseases, 24·3%, and for the others 48·3%, *i.e.*, roughly 73% due to preventable causes.

The comparative table of admissions and deaths for the past three years is as follows :—

	In-patients.			Deaths.		
	1918.	1917.	1916.	1918.	1917.	1916.
European Officials	105	58	92	1	1	2
Native Officials	1,071	555	535	6	—	1
European General Population	173	51	63	7	1	3
Native General Population	4,762	2,544	4,144	225	137	179

(ii). COMMUNICABLE DISEASES.

MOSQUITO OR INSECT-BORNE.

Malaria.—In spite of the increase in the number of cases over the preceding year the death-rate at the Coast compares more favourably, and also with the up-country districts. The numbers for the three years were as follows :—

	Admissions.			Deaths.
1918	5,818			4
1917	4,748			8
1916	6,089			16

Filariasis.—This year 3 cases were noted as against 5 and 24 respectively in previous year.

INFECTIOUS OR EPIDEMIC.

Cerebro-spinal-meningitis :—

	Cases.			Deaths.
1918	18			11
1917	19			10
1916	7			7

Dysentery.—Of the total number of cases 23 Europeans came under treatment with one fatality. The contrast for three years is as follows :—

	Cases.			Deaths.
1918	519			46
1917	312			11
1916	498			30

Enteric.—There were three cases (all Europeans) this year, as against one in 1917 and ten in 1916. For the past two years there have been no deaths.

Leprosy.—Seven new cases were admitted during the year, and there were two deaths. In 1917 there were two admissions, and two in 1916.

Plague.—Two cases remained from last year, and recovered. It is satisfactory to record that plague did not break out in the Coast area afresh, as against its appearance in the two previous years. Three cases which were not treated in the Infectious Diseases Hospital, Mombasa, were reported by the Medical Officer of Health in January and as being the last of the 1917 epidemic.

Small-pox.—The record for the year showed :—

				Cases.	Deaths.
1918	...	...	...	36	9
1917	...	...	...	11	7
1916	...	...	...	71	23

Four of these cases were Europeans disembarked from a ship, one of whom died.

Tetanus.—There were two cases, one fatal, admitted during the year, being one less than in the two preceding years.

Tuberculosis.—This disease is not an uncommon condition in Lamu, and it is evident that it is increasing on the coast. The in and out cases treated for 1918 were 63, with 21 deaths. In 1917 these figures were respectively 53 and 15.

Venereal diseases.—The cases treated were as follows :—

Syphilis	...	...	...	52	172
Gonorrhœa	...	...	...	53	270

The cases recorded last year as coming under treatment were :—

Syphilis	...	...	...	...	...	181
Gonorrhœa	...	...	...	...	...	336

HELMINTHIC.

The list of intestinal parasites which came under notice during the year was as follows :—

Cestoda	T. solium	...	...	...	55
	T. saginata	...	...	...	55
Nematoda	A. lumbricoides	...	...	...	133
	A. duodenale	...	...	...	268
	T. dispar	...	...	...	4

Assistant Surgeon P. Hira Nand, continuing his series of examinations in 823 cases, selected as a whole, in that they were either suffering from intestinal disturbances or displayed sufficient clinical evidence to call for confirmation by the microscope found that 66·1 per cent were positive, and 33·9 per cent. negative. 132 individuals showed double infection, 42 triple, and two quadruple. *A. duodenale* headed the list, being found 307 times.

(b) EUROPEAN OFFICIALS.

For the past three years the statistics were as follows :—

				In-patients.	Out-patients.
1918	...	...	...	105	99
1917	...	...	...	58	85
1916	...	...	...	92	89

The principal ailments were malaria (53), digestive disorders (44), influenza (9), dysentery (8). There was one death from pneumonia, the same as last year, and as against two in 1916.

Invalidings were 10, one more than 1917 and the 12 recorded for 1916. The causes were neurasthenia (3), anæmia, dyspepsia, malaria, diseases of arteries, tuberculosis, influenza, neuritis (one each).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE COAST ZONE.

	1916.	1917.	1918.
Total number of officials resident	247	186	182
Average number resident	148	109	118
Total number on sick list	92	58	105
Total number of days on sick list	678	436	843
Average daily number on sick list	1·85	1·19	2·30
Percentage of sick to average number resident ...	1·25	1·09	1·94
Average number of days on sick list to each patient ...	7·37	7·51	8·02
Average sick time to each resident	2·74	2·34	4·63
Total number invalided	12	9	10
Percentage of invaliding to total residents	4·86	4·84	5·49
Total deaths	2	1	1
Percentage of deaths to total residents... ..	·81	·53	·55
Percentage of deaths to average number resident ...	1·35	·91	·84
Total number of cases of sickness contracted away from residence	—	—	—

(c) **NATIVE OFFICIALS.**

There was a large increase in the number of cases which presented themselves for treatment, as is shown by the following table:—

	In-patients.	Out-patients.
1918	1,071	995
1917	555	594
1916	541	573

The deaths were six, as against nil in 1917 and one in 1916, and were due to influenza (2), dysentery, malaria, blackwater fever, tuberculosis (1 each).

The invalidings for the three years were 10, 6 and 7; this year due to neurasthenia, tuberculosis, keratitis, ankylostomiasis, eye affection, facial paralysis, D.A. of heart, alcoholism, influenza (1 each).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS AT THE COAST ZONE.

	1916.	1917.	1918.
Total number of officials resident	719	691	667
Average number resident	549	517	473
Total number on sick list	541	555	1,071
Total number of days on sick list	2,740	2,481	6,111
Average daily number on sick list	7·49	6·79	16·74
Percentage of sick to average number resident ...	1·36	1·31	3·53
Average number of days on sick list to each patient ...	5·06	4·46	5·70
Average sick time to each resident	3·81	3·57	9·16
Total number invalided	6	4	10
Percentage of invaliding to total residents	·83	·58	1·50
Total deaths	1	—	6
Percentage of deaths to total residents... ..	·14	—	·90
Percentage of deaths to average number resident ...	·18	—	1·27
Total number of cases of sickness contracted away from residence	—	—	—

(d) GENERAL EUROPEAN POPULATION.

The totals recorded for the three years were as follows:—

				In-patients.	Out-patients.
1918	...	...	...	173	174
1917	...	...	...	51	236
1916	...	...	...	63	165

There were seven deaths, as against one and three in the two preceding years. These were due to dysentery, malaria, pneumonia, small-pox, tuberculosis, injuries, poison.

The chief ailments were, malaria (84), digestive (68), influenza (22), dysentery (15), enteric (3).

One case of dengue was recorded and a few cases of Pappataci fever. The phlebotomus has been identified by Professor Nuttall as *Phlebotomus minutus* (Rond) var. *Africana* (Newst). Its distribution is extensive, and ranges so far as known from the Soudan to Nyasaland.

Births.—The number registered for 1918 was 15, in 1917, 16, and in 1916, 9.

Deaths.—The registered total of deaths for 1918 was 9, for 1917, 14, and for 1916, 8.

(e). NATIVE GENERAL POPULATION.

The natives of the coast suffered as severely as their brothers elsewhere, due to the same causes. Table as follows:—

				In-patients.	Out-patients.
1918	...	...	...	4,762	19,494
1917	...	...	...	2,544	17,877
1916	...	...	...	4,144	23,355

There was a marked increase in the number of deaths as compared with other parts of the country. Dr. Shircore estimated that the incidence of influenza pressed very little on the coast native, as he found out of his cases that 92% were amongst the up-country boy working at sea level. In comparison with former years the increase in the death rate may be attributed to the influenza epidemic, which accounted for 80 deaths alone. Table as follows:—

						Deaths.
1918	...	...	...	...	...	225
1917	...	...	...	...	...	137
1916	...	...	...	...	...	179

Deaths were principally due to:—Influenza (80), small-pox (8), pneumonia (16), tuberculosis (9), dysentery (44), ankylostomiasis (14), respiratory (5), diarrhoea (3).

The majority of the ailments were due to the following causes:—Malaria (4,928), local injuries (3,509), digestive (3,549), influenza (2,142), dysentery (471), parasitic infections (764), pneumonia (81), and tuberculosis (59).

III.—THE KENIA AND NYANZA PROVINCES.

(a). GENERAL REMARKS.

The famine conditions which prevailed in the Kenia province reflected most adversely on the health conditions of this province. The natives used up every available food product down to the indigenous roots in the first three months of the year. A native grass similar to a native grain was a common food from which a gruel was made, and gave rise to diarrhoea after a few days. Thousands of sheep were sacrificed in order to propitiate the Rain Giver and afterwards eaten. After this the natives were entirely dependent on famine maize imported by the Government, but the failure of supplies of fodder for the ox transport limited the stores available from this source. In consequence thousands of emaciated natives had to walk fifty miles to Thika railway station for supplies of grain, undertaking a physical effort which could only but add to the mortality. The efforts of the Administration and other Europeans were taxed to the uttermost to meet the emergency, but a very large number of the deaths were due to the natives' own apathy. Adult males remained in the reserve oblivious of the fact that they were helping to eat up the slender resources of their villages instead of going out to work.

It was fortunate that an abundant harvest came in August and September.

The Kavirondo province felt the effects of the drought, but not so severely.

(i.) GENERAL DISEASES.

A general increase in the number of cases which came under review was recorded. The comparative table of admissions and deaths for the two provinces was as follows:—

	In-patients.			Deaths.		
	1918.	1917.	1916.	1918.	1917.	1916.
European Officials	85	54	61	Nil	Nil	Nil
Native Officials	534	439	288	5	Nil	Nil
European General Population	109	67	58	2	2	1
Native General Population	4,435	3,414	3,600	628	257	361

(ii.) COMMUNICABLE DISEASES.

MOSQUITO OR INSECT-BORNE.

Malaria.—While the drought reacted adversely in other directions, the deficient rainfall gave a less incidence of admissions for malaria, though the death rate was slightly higher.

The comparative table was:—

Year.	Cases.	Deaths.
1918	4,632	15
1917	5,477	12
1916	5,304	4

65 Europeans came under treatment, as against 70 and 71 in previous years.

Blackwater fever.—No Europeans contracted the disease during the year. There were six cases in all, as against two and one in previous years. One was a native official, who recovered, while five natives died. The deaths in 1917 and 1916 were one for each year.

INFECTIOUS OR EPIDEMIC.

Cerebro-spinal-meningitis.—There were 13 fatal cases recorded amongst natives during the year. It almost looks as if famine conditions were not conducive to the spread of this disease. The numbers for the three years were as follows :—

			Cases.			Deaths.
1918	...	...	21	...	...	13
1917	...	...	128	...	...	92
1916	...	...	19	...	...	14

Dysentery.—There was an epidemic of this disease at Fort-Hall and Embu during July and August and in Nyeri jail.

In the Nyanza province Mumias showed the greatest proportion of cases. Twelve cases occurred amongst Europeans. Returns for the three years showed :—

			Cases.			Deaths.
1918	...	...	923	...	...	87
1917	...	...	569	...	...	47
1916	...	...	804	...	...	26

Leprosy.—One case recorded at Fort Hall, and three at Kisumu.

Plague.—With the exception of two cases, one non-fatal at Kisumu, this pest was absent from the provinces.

Small-pox.—Figures for the past three years were as follows :—

			Cases.			Deaths.
1918	...	...	224	...	...	62
1917	...	...	55	...	...	19
1916	...	...	630	...	...	212

Thirty-two cases were treated in Kenia and 192 in the Nyanza Province.

Tetanus.—1918, one case fatal.

1917, two.

1916, three.

Yaws.—1918 213 cases.
 1917 262 ,,
 1916 146 ,,

Influenza.—This disease spread with appalling rapidity throughout the two provinces and the mortality was high.

Venereal diseases.—The total numbers presented for treatment in the two provinces were as follows :—

			In-patients.			Out-patients.
Syphilis	...	...	48	...	...	263
Gonorrhœa	...	...	43	...	...	146

The total numbers treated in 1917 were :—

Syphilis	...	...	...	...	...	361
Gonorrhœa	...	...	...	...	...	179

HELMINTHIC.

The two provinces recorded the following numbers :—

Cestoda	T. solium	...	...	...	...	28
	T. saginata	...	..	...	...	5
Nematoda	A. lumbricoides	...	...	...	...	583
	A. duodenale	...	...	...	...	40
	O. vermicularis	...	...	...	...	8

The totals for the two years were respectively 664 and 586, but with the exception of Dr. N. P. Jewell's (*vide* appendix I.) and Dr. J. O. Shircore's reports, little systematic investigation has been carried out in these two provinces.

(b) EUROPEAN OFFICIALS.

On the whole the general health of the European officers in these two provinces would appear to have been rather better than elsewhere, though statistics show that they were not so favourable as last year. The comparative statistics for the three years were :—

				In-patients.	Out-patients.
1918	...	...	...	85	60
1917	...	...	...	57	62
1916	...	...	...	61	87

As in the previous two years there were no deaths and the invalidings 10—two more than in 1916.

The most notable diseases were influenza (25), malaria (24), digestive troubles (20).

The causes of the invaliding were, neuritis and neurasthenia (6), debility (2), malaria, optic neuritis (1 each).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST EUROPEAN OFFICIALS IN THE KENIA AND NYANZA PROVINCES.

	1916.	1917.	1918.
Total number of officials resident	141	119	123
Average number resident	104	76	74
Total number on sick list	61	57	85
Total number of days on sick list	316	462	688
Average daily number on sick list	·86	1·26	1·88
Percentage of sick to average number resident	·82	1·67	2·54
Average number of days on sick list to each patient	5·18	8·10	8·09
Average sick time to each resident	2·24	3·88	5·59
Total number invalided	2	4	5
Percentage of invaliding to total residents	1·42	3·36	4·06
Total deaths	—	—	—
Percentage of deaths to total residents...	—	—	—
Percentage of deaths to average number resident	—	—	—
Total number of cases of sickness contracted away from residence	—	—	—

(c) NATIVE OFFICIALS.

The table for the return of sickness amongst the staff showed as follows :—

				In-patients.	Out-patients.
1918	...	...	...	534	260
1917	...	...	...	439	251
1916	...	...	...	290	138

The mortality has been unusually high, 5 deaths this year—due to influenza (3), dysentery, respiratory disease (1 each). There were no deaths the two previous years.

The invaliding rate was also high—9, as against 1 and 4 in the preceding years. The causes were, malaria (2), neurasthenia, tuberculosis, asthma, debility, appendicitis, gastritis, and anæmia (1 each).

The chief disabilities suffered from were, influenza (128), malaria (107), respiratory diseases (60), and dysentery (18).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES AMONGST NATIVE OFFICIALS IN THE KENIA AND NYANZA PROVINCES.

	1916.	1917.	1918.
Total number of officials resident	293	288	257
Average number resident	215	201	187
Total number on sick list	290	445	534
Total number of days on sick list	1,635	2,800	3,704
Average daily number on sick list	4.47	7.67	10.14
Percentage of sick to average number resident ...	2.08	3.81	5.42
Average number of days on sick list to each patient ..	5.64	6.31	6.93
Average sick time to each resident	5.58	9.72	14.41
Total number invalided	4	1	9
Percentage of invaliding to total residents	1.36	.34	3.50
Total deaths	—	—	5
Percentage of deaths to total residents... ..	—	—	1.94
Percentage of deaths to average number resident ...	—	—	2.67
Total number of cases of sickness contracted away from residence	—	—	—

(d) **GENERAL EUROPEAN POPULATION.**

There was a considerable increase in the number of those who presented themselves for medical treatment. There were recorded for the three years :—

	In-patients.	Out-patients.
1918	109	173
1917	67	116
1916	58	36

Two deaths occurred, same number as in the previous year, one due to influenza and one to diarrhoea.

Births.—There were registered 14, as against 4 in the previous year.

Deaths.—Three were registered, in comparison with 7 of the previous year.

(e) **GENERAL NATIVE POPULATION.**

As was to be expected, there was a considerable increase in the number of admissions, and especially the mortality rate, almost wholly due to influenza.

The statistical tables were :—

	In-patients.	Out-patients.
1918	4,436	30,937
1917	3,414	26,413
1916	3,600	28,681
Death rate, 1918	628	
1917	297	
1916	361	

The main causes were, influenza (282), dysentery (86), pneumonia (36), digestive (37), small-pox (62), cerebro-spinal-meningitis (13).

Most of the ailments were caused by malaria (4,203), influenza (4,522), dysentery (868), local injuries (7,228), pneumonia (157), chicken-pox (323), and small-pox (224).

IV.--THE DESERT ZONE.

(a.) GENERAL REMARKS.

Reports from these two are meagre, but the conditions of health would appear to have been very much the same as in previous years. The most noticeable factor was a continuation in an exaggerated form of scurvy as referred to in the last year's report.

The figures for the past three years gave the following :—

	In-patients.			Deaths.		
	1918.	1917.	1916.	1918.	1917.	1916.
European Officials	36	37	8	—	—	—
Native Officials	30	35	36	—	—	—
European General Population	—	1	—	—	—	—
Native General Population	1,402	2,056	1,082	56	50	16

The returns from the Northern Frontier District were admittedly incomplete, owing to the paucity of doctors.

The recommendation in the last two years' reports that officers should be provided with lined tents has not yet been given effect to.

(ii.) COMMUNICABLE DISEASES.

MOSQUITO OR INSECT-BORNE.

Malaria.—The increase in the number of cases noted last year has been more or less maintained with a lessened mortality. The table recorded during the three years :—

	Cases.	Deaths.
1918	2,024	1
1917	2,395	4
1916	1,548	5

INFECTIOUS OR EPIDEMIC.

Beri-beri.—Excluding those alluded to on page 85, amongst returned convicts from Jubaland there were 8 new cases (1 of whom was an European official), as against 84, with 19 deaths, in 1917, and 24 cases in 1916.

Cerebro-spinal-meningitis.—Was very much apparent in Kismayu, 57 cases, with 2 deaths, as against 5, with 1 death, in 1917.

DYSENTERY.—Six Europeans suffered during the year. The statistical table was as follows :—

	Cases.	Deaths.
1918	152	6
1917	339	5
1916	90	3

Scurvy.—203 cases, 16 deaths, as compared with 5 cases, 1 death, in 1917, and 2 cases in 1916. The treatment of this preventable disease was much hampered by the difficulty of growing fresh vegetables and the absence of sea transport to bring in fresh supplies. The outbreak was finally controlled by the importation of a large consignment of green cocoa-nuts from Zanzibar on the suggestion of Dr. E. Dias.

Venereal diseases.—The total cases recorded were as follows :—

	In-patients.	Out-patients.
Syphilis	5	23
Gonorrhœa	18	64

The number of cases treated in 1917 were :—

Syphilis	32
Gonorrhœa	86

HELMINTHIC.

Cestoda	T. solium	52
	T. saginata	2
Nematoda	A. duodenale	1
	A. lumbricoides	66
	O. vermicularis	20

The numbers for the three years were :—1918, 141; 1917, 115; 1916, 133.

(b) EUROPEAN OFFICIALS.

The sick rate amongst the small handful of officials kept fairly constant :—

	In-patients.	Out-patients.
1918	36	113
1917	37	77
1916	8	48

There were no deaths, but two officers were invalided, one for anæmia and the other for neuritis.

The most notable diseases were :—Malaria (18) and dysentery (4).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST EUROPEAN OFFICIALS IN THE DESERT ZONE.

	1916.	1917.	1918.
Total number of officials resident	27	17	21
Average number resident	18	11	16
Total number on sick list	8	37	36
Total number of days on sick list	63	209	291
Average daily number on sick list	·17	·57	·79
Percentage of sick to average number resident	·94	5·18	4·93
Average number of days on sick list to each patient	7·87	5·64	8·08
Average sick time to each resident	2·33	11·94	13·86
Total number invalided	—	1	1
Percentage of invaliding to total residents	—	5·88	4·76
Total deaths	—	—	—
Percentage of deaths to total residents	—	—	—
Percentage of deaths to average number resident	—	—	—
Total number of cases of sickness contracted away from residence	—	—	—

(c) NATIVE OFFICIALS.

	In-patients.	Out-patients.
1918	30	100
1917	35	108
1916	36	87

There were no deaths, but one man was invalided for iritis.

Of the principal ailments there were only 7 cases of influenza, which showed that these desert tracts afford no bar to the spread of this disease; malaria (27), digestive troubles (47), and nervous system (17).

TABLE SHOWING THE SICK, INVALIDING AND DEATH RATES
AMONGST NATIVE OFFICIALS IN THE DESERT ZONE.

	1916.	1917.	1918.
Total number of officials resident	50	31	50
Average number of resident	42	26	40
Total number on sick list	36	35	30
Total number of days on sick list	191	246	172
Average daily number on sick list	·52	·67	·47
Percentage of sick to average number resident ...	1·24	2·57	1·17
Average number of days on sick list to each patient ...	5·30	7·02	5·73
Average sick time to each resident	3·82	7·93	3·44
Total number invalided	—	—	1
Percentage of invaliding to total residents	—	—	2·00
Total deaths	—	—	—
Percentage of deaths to total residents	—	—	—
Percentage of deaths to average number resident ...	—	—	—
Total number of cases of sickness contracted away from residence	—	—	—

(d) **GENERAL EUROPEAN POPULATION.**

Only 20 Europeans applied for outdoor medical treatment.

No births nor deaths were registered—same as last year.

(e) **GENERAL NATIVE POPULATION.**

	In-patients.	Out-patients.
1918	1,402	8,552
1917	2,056	8,650
1916	1,082	6,815

56 deaths occurred during the year, as against 50 and 16 in the two previous years.

The causes of death were :—Scurvy (16), pneumonia (8), dysentery and diarrhoea (6 each), influenza (4), anæmia and bronchitis (3 each), cerebro-spinal-meningitis and tuberculosis (2 each), malaria, mitral disease of heart, broncho-pneumonia, cirrhosis of liver, disease of lymphatic system and injuries (1 each).

III.—SANITATION.

REPORT BY DR. W. J. RADFORD, PRINCIPAL SANITATION
OFFICER, E.A.P.

(i.) ADMINISTRATION.

1. The sanctioned personnel of the Sanitation Division at the commencement of the year 1918 was as follows :—

	<i>Sanctioned.</i>	<i>Actually Employed.</i>
Principal Sanitation Officer ...	1	1
Medical Officers of Health ...	13	3 (acting)
Sanitary Inspectors ...	14	7
Nurses ...	1	1
Assistant Surgeons ...	6	2
Sub-Assistant Surgeons ...	7	5
Compounders ...	3	1
Chief Vaccinator ...	1	1
Vaccinators ...	56	56
Clerks ...	10	10

2. Appointments during the year :—

1 Sanitary Inspector.

3. Invalided during the year :—

1 Medical Officer of Health.

4. Leave during the year :—

2 Sanitary Inspectors.

5. Resumption of duty from leave :—

3 Sanitary Inspectors.

6. Deaths during the year :—

Dr. B. W. Cherrett, Medical Officer of Health, Nairobi.

(ii.) LEGISLATION DURING 1918 AFFECTING THE MEDICAL DEPARTMENT.

- (1) Nairobi Township Building (Deposit or Materials) Rules, 1918.
- (2) Nairobi Township (Building Amendment) Rules, 1918.
- (3) Infectious Diseases Ordinance, 1903—Extension of powers to Health Officers.
- (4) Nairobi “guttering” Rules, 1918.
- (5) The Townships Amendment Ordinance, 1918.
- (6) The Townships (Public Health, Segregation of Races) Rules, 1918.
- (7) Nairobi Sale of Milk Rules.
- (8) The Merchants Shipping Fees Ordinance as applied to Bills of Health.

(iii.) PREVENTIVE MEASURES. MOSQUITO AND INSECT-BORNE DISEASES.

MALARIA.

MALARIA, RECORDED CASES AND DEATHS.

Year.	Cases.	Deaths.
1913	15,656	81
1914	15,096	119
1915	18,175	283
1916	18,238	206
1917	17,968	305
1918	21,194	195

At Mombasa, Nairobi and Kisumu, gangs of natives trained in anti-malarial measures are attached to the staff of the Health Offices, and considerable activity has been maintained in clearing drains, filling in excavations and oiling water, and in discovering the breeding places of the mosquito.

The number of mosquitoes in the town of Kisumu has been lessened during the past years where the work of clearing the foreshore of weeds and papyrus has been continued and the prevalence has been reduced by the draught experienced during the year, which dried the Kano plains and other swampy low-lying lands in the vicinity. But the splenic index compiled from an examination of 200 children shows $27\frac{1}{2}\%$, and from these figures it would appear that there is an appreciable amount of malaria in the town.

70 deaths from malaria were registered in Nairobi, and 81 in Mombasa; and the disease has been reported from every station in the country.

"Millions" fish have been supplied in 17 instances to various parts, and in one instance the fish have been found to be breeding in a well at Mombasa, generally those wells that have been stocked with fish are negative for mosquito larvæ.

BLACKWATER FEVER.

21 cases and 14 deaths were registered among the civil population during the year.

PLAGUE.

Fortunately plague did not appear in Nairobi during the year, only one case occurred at Kisumu, and the three deaths recorded in Mombasa should be included in the returns of the 1917 epidemic.

Eight cases, 5 fatal, occurred at Nakuru during June.

The possible cause of this outbreak was an Arab who came from Kisumu.

He went to Njoro, where he developed the disease, and was brought back by the Police to hospital, where he died a few days later.

Rat trapping and systematic investigations have been continued throughout the year.

Kisumu, 2,679; 14 infected with bipela bacilli resembling *B. pestis*.

Nairobi, 4,142; none infected.

Mombasa, 7,936; none infected.

RAT DESTRUCTION.

	Year.	Numbers caught.	Numbers infected.
	1916	21,503	42
	1917	20,776	37
	1918	14,757	14

PROPHYLACTIC INOCULATION.

The figures quoted represent the number of "voluntary" inoculations that have been performed. The measure appears to be popular among the Asiatic communities.

	1916.	1917.	1918.
	18,273	100,214	37,430

The total number of cases reported in the Protectorate for the year were 12 cases, with 8 deaths, viz. :—

				Cases.	Deaths.
Nakuru	...	...	...	8	5
Kisumu	...	...	...	1	0
Mombasa	...	...	...	3	3

SMALL-POX.

The epidemic reported in 1915 has continued without intermission to date.

Duirng the year, 2,576 cases and 805 deaths were registered, but this gives no indication of the extent and distribution of the epidemic.

Mombasa, Nairobi, Voi, Machakos, Makindu, Kyambu, Nyeri, Meru, Kisumu, Mumias, Nakuru, Eldoret, Ravine, and the Northern Frontier, have all reported the occurrence of the disease. Eleven European cases, with two deaths, were included in these lists.

Twelve cases were landed at Mombasa during the year from ships arriving from Bombay. Four of these were Europeans, of whom one died.

VACCINATION.

	1916.	1917.	1918.
Number of cases of small-pox	2,513	1,520	2,576
Vaccinations	977,055	297,303	428,079

The lymph used for years by both military and civil departments was prepared by the Director of Laboratories; its potency has been the subject of investigation.

It has been realized that not only has the vaccine failed to confer immunity, but delayed results have been observed during the last decade.

Unsatisfactory results from the 1916 strain necessitated a complete change of strain on 5th September, 1917, but there is every reason to conclude that a satisfactory vaccine has not as yet been prepared that affords immunity in all parts of this country and in Uganda.

Seed lymph from England, Bombay, Dar-es-Salaam and local strains have all been used at various times during the last 10 years, and whatever general success has attended their use—and in no case is the evidence entirely negative in this respect—the experience gathered has been that no strain, whether derived from overseas or local, has been successful over a prolonged period unless it has been reinforced. Generally, a new strain has been substituted for the old.

The question is now under definite consideration.

The appended table shows the places at which vaccination was carried out during the year.

STATEMENT SHOWING THE PLACES AND NUMBER OF
VACCINATIONS PERFORMED AT EACH DURING THE
YEAR 1918.

STATIONS.						VACCINATIONS.			
						Number.	Failed.	Perfect.	Unknown.
Mombasa	...	...	...	...	...	33,719	—	—	33,719
Lamu	...	...	...	...	...	3,031	12	40	2,979
Malindi	...	...	...	...	...	25	6	7	12
Machakos	...	...	...	...	...	15,116	—	—	15,116
Nairobi Prison	...	...	...	...	...	624	37	65	522
Nairobi	...	...	...	...	...	116,598	—	—	116,598
Kyambu	...	...	...	...	...	28,497	22	10	28,465
Makindu	...	...	...	...	...	4,117	—	—	4,117
Kitui	...	...	...	...	...	6,409	50	210	6,149
Nakuru	...	...	...	...	...	2,116	—	1	2,115
Naivasha	...	...	...	...	...	156	24	81	51
Eldama Ravine	...	...	...	...	...	1,254	5	8	1,241
Kabarnet	...	...	...	...	...	137	12	55	70
Kacheliba	...	...	...	...	...	266	69	111	86
Fort Hall	...	...	...	...	...	55,353	—	—	55,353
Nyeri	...	...	...	...	...	63,683	—	—	63,683
Embu	...	...	...	...	...	7,850	—	—	7,850
Meru	...	...	...	...	...	2,534	3	273	2,258
Kisumu	...	...	...	...	...	41,861	—	—	41,861
Mumias	...	...	...	...	...	11,011	—	—	11,011
Kericho	...	...	...	...	...	15,551	21	339	15,191
Nandi	...	...	...	...	...	96	—	—	96
Mombasa Prison	...	...	...	...	...	566	249	297	20
Eldoret	...	...	...	...	...	1,516	275	336	905
Kismayu	...	...	...	...	...	102	40	25	37
Mfudu	...	...	...	...	...	49	—	—	49
Dagoretti	...	...	...	...	...	15,842	—	—	15,842
TOTAL						428,079	825	1,858	425,396

ENTERIC.

Twenty-two cases with 10 deaths were reported during the year; the number of voluntary inoculations performed in the country was three. Nairobi accounted for more than half the total number of cases reported.

CEREBRO-SPINAL-MENINGITIS.

A considerable decrease in the case incidence was observed during the year in comparison with the preceding. The seasonal incidence bears out the observations made in previous years, viz., that it is more prevalent in the cold season and that the percentage of Africans affected is greater than any other community.

The following table of observed cases only gives some indication of the extent and distribution of the disease during the last three years :—

	1916.		1917.		1918.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	128	82	796	615	202	104

CHICKEN-POX.

1,477 cases with seven deaths were notified, as compared with 1,054 and three deaths in 1917.

MEASLES.

The decline in the number of cases reported in 1917 was maintained during the year; only 41 cases with no deaths were reported.

DYSENTERY.

The returns submitted by the Government Hospitals and Dispensaries disclose a considerable increase in this group; from the nature of the case it has been impossible to estimate the prevalence of the disease in the out districts and in the country generally, but there is every reason to suppose that the community as a whole has suffered to a greater extent than in previous years.

The returns from the Government Institutions show the following observed cases :—

		1916.		1917.		1918.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	Europeans	246	6	84	...	127	5
	Asiatics and Africans	3,323	191	2,529	160	4,401	320

In addition to the deaths notified in the Government Institutions, the Medical Officers of Health have reported 331 registered deaths from these diseases.

It has been impossible to conduct any investigations regarding the type of dysentery, amoebic or bacillary, on account of the depleted staff.

MUMPS.

422 cases with one death were reported.

ANTHRAX.

15 cases with four deaths were observed.

INFLUENZA.

Towards the end of September, influenza was notified at Mombasa, the condition apparently accounting for six deaths on board a vessel that had come from India, where the occurrence of the disease had been notified early in the year. Within a few days Nairobi was invaded, and from then until the end of the year the epidemic swept through the country.

The general conditions prevailing favoured its spread. The community had experienced the stress and anxieties consequent on the protracted hostilities, and famine had appeared in many parts.

The certified number of cases and deaths from influenza up to the end of December, 1918, was 15,474 cases with 809 deaths, and pneumonia 2,362 cases and 1,390 deaths; but this in no sense represents the extent or ravages of the epidemic in the country generally.

Careful statistics have been compiled by Administrative Officers, Missionaries and others showing, 501,772 cases with 39,927 deaths, but here again the figures can only be regarded as approximate.

To cope with such an invasion was entirely beyond the means at the disposal of Government. It is difficult to trace the origin of the disease, and to state through what channels it reached the country. Prior to the recognition of the condition there had been an universal amount of coryza "Fever" observed among certain communities, *i.e.*, Police at Mombasa, King's African Rifles in Nairobi, and Lamu, a coastal town that had had no communication with other countries during September, reported fatal influenza early in October.

The death rate in Mombasa gives an indication of what took place in other towns: January, 62; February, 44; March, 46; April, 58; May, 65; June, 75; July, 71; August, 73; September, 101; October, 173; November, 155; December, 54; the rise in the death rate taking place in September, declining towards the normal at the close of the year.

The coast belt can be said to have shown a clean bill of health as far as the disease was concerned towards the end of the year, and elsewhere its virulence was declining.

PAPPATACII FEVER.

Pappatacii Fever is recorded by the Medical Officer, Native Civil Hospital, Mombasa, as occurring.

Specimens of a sand fly probably *Phlebotomus minutus* were sent to this office from a house in the European quarter during the year. They have not at any time, however, been particularly abundant.

TABLE SHEWING THE NUMBER OF PATIENTS TREATED
IN QUARANTINE CAMPS.

Disease.	Mombasa.		Nairobi.		Kisumu.		TOTAL.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	CASES.	DEATHS.
Cerebro-spinal-meningitis	—	—	40	26	19	11	59	37
Chicken-pox ...	8	—	338	—	61	3	407	3
Anthrax... ..	—	—	5	1	—	—	5	1
Leprosy	7	2	5	—	3	—	15	2
Measles	1	—	5	—	2	—	8	—
Mumps	—	—	162	—	—	—	162	—
Plague	—	—	—	—	1	1	1	1
Pemphigus	—	—	1	—	—	—	1	—
Small-pox	29	8	640	253	162	54	831	315
Yaws	1	—	1	—	13	—	15	—
Other diseases	11	—	31	8	82	12	124	20
TOTAL	—	—	—	—	—	—	1,628	379

HELMINTHIC DISEASES.

ANKYLOSTOMIASIS.

319 cases with 16 deaths have been reported during the year; of these, 267 cases with 14 deaths were reported at the Coast, 49 cases with two deaths in the Nyanza and Kenia Provinces, two cases in Ukamba, and one in the Desert Zone.

FILARIASIS.

Four cases have been recorded during the year with no death.

LEPROSY.

No advance has been possible last year in the formation of depôts for the reception of the many lepers observed in many parts of the Protectorate. At Mzizima, on Mombasa Island, and near Malindi, these persons are received in permanent camps, where no adequate supervision or accommodation can be afforded.

(iv.) GENERAL MEASURES.

SEWAGE DISPOSAL.

No advance has been made during the year as regards the disposal of sewage, either by a water-borne system, or any form of treatment. It can be said that the disposal by means of dumping in the sea, trenching, incineration, collection in cesspools or distribution on the ground, is in no instance satisfactory, and, within some of the more settled areas, constitutes a danger to the public health.

SCAVENGING.

The Health Offices are not responsible for the conservancy of the chief towns—this important part of the general sanitation is controlled either by the local authorities, or directly by a Government Department, and in out stations by Administrative Officers.

Labour difficulties, financial restrictions and the absence of central control have all been contributory factors in producing the unsatisfactory state of affairs that is so evident in many settled areas, but great credit is due to the authorities at Kisumu, where the conservancy arrangements are satisfactory.

WATER SUPPLY.

Water distribution is controlled by the Public Works Department in Mombasa ; but in Nairobi, Nakuru and Kisumu, the Railway Department is in executive charge. In no township has it been found possible to safeguard the water supplies either by means of storage, treatment (filtration or chemical), or to protect the gathering grounds and intake.

Not only is development within towns and in their vicinity restricted by the inadequacy of the various supplies, but the actual amount available is insufficient for present requirements at Nairobi and Nakuru. There is abundant evidence to show that the Nairobi supply in its present state is a danger to public health. It is hoped that when the various towns are in a position to conduct their own affairs, that attention will be directed to this important matter, and the water supply will be controlled by the municipalities and will receive immediate care and attention.

DRAINAGE.

New drains have been constructed to the extent of 500 yards in Mombasa and 44 in Kisumu.

The Health Office staff have continued the work performed in previous years to the benefit of the public by clearing earth drains and channels, as follows :—

Mombasa	...	...	All maintained in good order.
Nairobi	...	...	135,927 yards.
Kisumu	...	...	2,846 „

BUSH CLEARING.

This work is undertaken by the Health Office staff in the chief townships, and in places where it is impossible to supervise and control it, monetary grants are made for the maintenance of working gangs.

The extent of the work performed is shown in the following table :—

Area kept clear of bush and grass :

Mombasa	...	...	...	...	1,030 acres.
Nairobi	...	...	...	...	960 „
Kisumu	...	...	...	...	18 „

HOUSING.

This important matter demands definite consideration, and it is hoped that when it is found possible to establish locations for the Asiatics and the Native communities in the more settled areas and to regulate the formation of Trading Centres in all parts of the country that the public health will benefit.

Inspection of commercial premises is carried on, and licences are granted by the Health Officer for premises prior to occupation.

A considerable part of the duties of the Sanitary Inspectors embraces inspection of premises :—

Mombasa	...	...	...	...	6,798
Nairobi	...	...	...	...	4,613
Kisumu	...	...	...	...	14,010

(v.) CONDITION OF TRADES AND FACTORIES.

PUBLIC MARKETS.

Mombasa	...	...	...	...	...	2
Nairobi	...	...	...	...	...	2
Kisumu	...	...	...	...	...	2

The public market at Mombasa remains unfinished, and the Piggot market has been dismantled.

The public market at Nairobi is not fully occupied, while the Native market presents many insanitary features.

The market at Kisumu is a private enterprise.

SLAUGHTER HOUSES.

Kisumu	...	...	...	...	...	2
Nairobi	...	...	...	...	...	2
Mombasa	...	...	...	...	...	2

Great improvement is required in the structure of these buildings.

Meat inspection is undertaken by the Health Office at Mombasa, where portions of 662 carcasses were seized during the year.

At Nairobi, the arrangements at the abattoir are in the hands of the Municipality and directly controlled by it.

NAIROBI.

Number of animals slaughtered and carcasses examined at the Municipal Slaughter House (excluding military) :

			Examined.	Condemned.
Oxen	...	...	3,732	149
Sheep and Goats	...	...	18,420	26
Pigs	...	...	565	1
Game	...	...	489	47

In addition, 267 carcasses were removed and incinerated by the Municipal staff.

AERATED WATER AND ICE FACTORIES.

79 inspections were made at Nairobi, and one factory was temporarily closed owing to the presence of large amounts of copper in the soda water produced.

98 inspections were made of four premises in Mombasa and seven in Kisumu.

DAIRIES AND MILK SUPPLY.

The regulation of the milk supply is urgently needed. In Nairobi, 56 samples were submitted to the analyst, who reports as follows :—33·9% were satisfactory, 50% were diluted with water, and 5·4% were so deficient in fat as to indicate skimming.

A comparative table showing the percentages of adulterations in the samples examined is added :—

1913	...	...	34 per cent.
1914	...	...	70 „
1915	...	...	73 „
1916	...	...	64 „
1917	...	...	59·7 „
1918	...	...	66·1 „

FOOD INSPECTION.

Inspection of various food commodities were conducted in the chief towns, where 19,362 samples were examined by the Health Office staff, and of these 956 were condemned as unfit for human consumption.

DISINFECTION.

This branch of the sanitary work is generally undertaken by the Division. The following table gives some indication of the extent and the nature of the work performed :

Premises	...	...	...	...	209
Ships	...	...	...	...	7
Railway Trucks	...	...	...	...	401
Other articles in bulk	...	...	...	...	840

SHIPPING.

Bills of Health issued :—

Port.	1916.		1917.		1918.	
	Steamers.	Dhows.	Steamers.	Dhows.	Steamers.	Dhows.
Mombasa ...	164	191	107	400	99	495
Lamu ...	10	118	1	175	5	117
Kismayu ...	27	44	16	45	17	155

The revenue derived from Bills of Health was :—

Mombasa ...	...	...	Rs.3,780·00
Lamu ...	...	...	1,496·00
Kismayu ...	...	...	525·00
TOTAL		...	<u>Rs.5,801·00</u>

IV.—METEOROLOGY.

It is a thousand pities that there is no weather Bureau in this Protectorate to investigate and report on the various climatic factors which so profoundly influence this colony. It is only by a complete series of observations that any determination can be arrived at, or deductions drawn with sufficient accuracy, as to what effect the wide range of peculiar conditions met with has on the well-being of its peoples—white or Asiatic immigrants, and on the African indigenous inhabitant—to assign the true value of its place amongst tropical countries.

Meteorology is a subject which requires special training ; so far, not one medical officer has ever submitted a single observation worth recording beyond the effects of rain and drought. All that can be put forward, therefore, under this heading, is the rainfall table. The localities given have been selected from the returns made to the Agricultural Department—the only one that takes any interest in this branch of science—with a view to give some idea of what the rainfall is like in the different zones.

TABLES SHOWING MEAN ANNUAL RAINFALL AT VARIOUS
POINTS IN THE DIFFERENT AREAS FOR THE THREE YEARS.

COAST AREA.

STATION.	1918.	1917.	1916.
Malindi... ..	30·69	27·11	33·90
Mombasa	35·30	40·83	42·37
Mazeras (11 months, 1917)	29·86	21·80	33·85
Mackinnon Road	23·55	20·36	18·17
Voi (11 months, 1916)	17·43	17·20	26·63

MOUNTAINOUS AREA.

Masongaleni	16·21	25·58	23·60
Makindu	12·61	17·50	68·89
Kiu	14·87	23·28	22·49
Athi River	14·71	27·61	27·58
Nairobi	22·66	57·22	46·03
Kabete (near Nairobi)	28·73	57·85	46·55
Naivasha	16·76	39·45	36·49
Nakuru... ..	24·49	68·20	45·03
Molo	25·99	71·05	67·80
Eldama Ravine	24·27	72·35	55·55

NYANZA AND KENIA PROVINCES.

Lumbwa	24·13	61·23	54·58
Muhoroni	41·77	63·05	84·81
Kisumu... ..	32·46	46·40	56·28
Mumias... ..	50·90	87·00	79·76
Kericho... ..	45·95	84·74	81·85
Nandi	35·80	86·65	83·83
Fort Hall	35·89	59·18	53·23
Nyeri	30·32	52·04	34·62
West Kenia	17·85	29·55	27·32

DESERT AREA.

Kismayu	5·82	15·02	19·45
Gosha Alexandra	(closed)	(closed)	22·33
M'fudu (11 months, 1917)	(closed)	19·27	—

Temperature and rainfall tables for Mombasa, Nairobi, Kisumu and Fort Hall are inserted in Table V. of the returns.

V.—HOSPITALS, DISPENSARIES AND INSTITUTIONS.

1.—EUROPEAN HOSPITALS AT NAIROBI AND MOMBASA.

The following table shows an increased record of work as compared with previous years.

TABLE SHOWING ADMISSIONS AND DEATHS.

		1918.	1917.	1916.
Total number of beds...	... ..	27	24	24
Total number treated ...	... ..	396	269	192
Total number discharged	... ..	347	247	176
Total number of deaths	... ..	33	11	8
Total number remaining	... ..	16	11	8

Of the total cases treated, 134 were officials and the remaining 262 were received from the European General population.

In addition to the above, 157 officials were treated as out-patients.

ADMINISTRATION.

At times the work was exceptionally heavy and was the occasion of a good deal of overwork on the staff, particularly during the influenza season.

Dr. F. L. Henderson was in charge at Mombasa till the end of April, when he was followed by Dr. J. Pugh, who continued in charged till the end of the year.

Dr. J. L. Gilks was in charge at Nairobi during the whole year.

Of officials, Nairobi treated 185 cases in hospital and quarters, as against 188 during the previous year : There were 19 deaths in all, of whom seven were officials. The causes of their deaths were, influenza (5), septicæmia (1) and Bright's disease (1), the others being due to dysentery (4), blackwater fever (1), pneumonia (3), tuberculosis (1), alcoholism (1), paralysis (1), and hernia (1).

At Mombasa, 66 officials were treated in hospital and quarters, as against 70 in 1917. There was one death amongst officials from pneumonia and seven amongst the general population due to dysentery (1), malaria (1), pneumonia (1), tuberculosis (1), ptomaine poisoning (1), enteritis (1) and sunstroke (1).

The mortality rate for the combined hospitals works out at 82·9 per 1,000. Last year it was 40·8.

The principal ailments were dysentery (28), influenza (50), malaria (105), and digestive troubles (60).

The following list shows the more important operations performed at the European Hospital, Nairobi :—

- 5 Appendicectomy.
- 5 Curettage.
- 4 Tonsillectomy.
- 1 Removal of polypus.
- 1 Laparatomy.
- 1 Urethrotomy.
- 1 Perineorrhaphy.
- 1 Amputation of Arm.
- 1 Excision of Carcinoma of sigmoid.

And those at Mombasa were :—

- 1 Curettage.
- 3 Circumcision.

SANITATION.

No additions or structural alterations were carried out during the year.

2.—THE CIVIL HOSPITALS AND DISPENSARIES.

The table for the past three years showed a very considerable increase in the number of admissions, and an abnormal mortality.

	1918.		1917.		1916.	
	In.	Out.	In.	Out.	In.	Out.
Admissions	17,215	95,069	12,825	92,376	12,273	95,550
Deaths	1,706	—	1,121	—	1,068	—
Death rate per 1,000 admissions	99·09	—	87·40	—	87·02	—

The death-rate—practically 10% of admissions—includes a very large percentage of moribund admissions, who die in the first twenty-four hours, which should properly be deducted to give a truer index. It is interesting to compare the civil figures with those which obtained in the Carrier Corps Hospitals for 1918. From figures very kindly supplied by Lt.-Col. Bligh-Wall, O.B.E., S.A.M.C., A.D.M.S., of the Carrier Corps, there was a total of 85,257 admissions to hospital (this, of course, embraces the whole sphere of operations in Eastern Africa), with 8,242 deaths, giving a ratio per 100 of deaths to admission of 9·67. The death-rate varied monthly from 4·3 to 26·3 (influenza epidemic). It must be remembered that the Carrier organization had the advantage of all the medical staff, Medical Officers and R.A.M.C., N.C.O.'s it could make use of, a trained native staff under military discipline, a generous diet and unlimited equipment, and one inestimable factor, supervision of nursing by qualified sisters and V.A.D's. Their buildings, if temporary, were not much below the standard of many of our limited Protectorate establishments, and, of course, no overcrowding, being designed for large numbers. It is much to be desired, as indicated in previous reports, that the question of adequate hospital buildings be early taken in hand, and that the native medical service be organised under its own conditions of service, pay, promotion and grades, on somewhat similar lines to the Police or K.A.R.

The work was carried out under the very gravest difficulties during the year—alluded to in the introductory paragraphs of this report.

The number of hospitals and dispensaries remained the same as last year, with the exception of Lokiriama (4 beds), from which a Sub-Assistant Surgeon had to be withdrawn, owing to paucity of staff; but few minor structural alterations or additions have been made. No addition was made to the number of beds.

104 operations were performed at the three chief hospitals—Nairobi, Mombasa and Kisumu.

3.—LUNATIC ASYLUM.

The following table gives the number of admissions and deaths during the last three years :—

	Admissions.			Deaths.		
	1918.	1917.	1916.	1918	1917.	1916.
Males	75	71	76	36	17	24
Females	21	11	14	7	2	4
Total	96	82	90	43	19	28

Dr. J. H. Thomson submits his fifth Annual Report on the Asylum as follows :—

During the year, 158 patients were treated altogether.

In five years the number of patients treated has more than doubled, notwithstanding the fact that practically only urgent cases are taken in.

ADMISSIONS.

The number admitted was 96—75 males and 21 females.

The female admissions are increasing, being nearly double that of any previous year, and it has been very difficult to accommodate them.

Nairobi has furnished the largest number of cases, as usual. A good many cases come from Lamu and Mombasa, and a few from other centres of European civilisation, where the native affected becomes a nuisance. Hardly any cases come from the reserves, and then only criminal cases as a rule. As far as I can gather from enquiries, there is a great amount of insanity in the reserves.

The principal admissions were Mania 49, Melancholia 3, Dementia 10, Delusional insanity 5. Patients were admitted also suffering from Alcoholic insanity, Epileptic insanity, Dementia precox, and from the temporary insanity which I described in 1916 as “Ngoma.” Natives in this country seem to suffer more from exaltation than from depression, therefore we do not see many cases of melancholia. Sometimes patients are admitted with their faculties in profound abeyance like stupor or dementia, and it is very difficult to diagnose at times between melancholia and the latter conditions.

As regards “Ngoma,” this seems to be fairly prevalent among all the tribes. At a murder case in the High Court this year, a Nandi assessor said that it happened among them that a man sold his brain for some hours and did not know what he did.

At another murder case, when a Kikuyu woman was charged with murdering her children, the woman got off on the plea of this transient insanity. The Judge asked me at the time if it were recurrent. I was unable to give any definite answer. Since the woman has been in the asylum she has had three very acute attacks, perhaps the most acute maniacal attacks I have ever seen. These last from a few days to a fortnight, and then she becomes suddenly quiet and normal again. It is no wonder that the natives think that such people are possessed by devils. They certainly look it from their whole bearing and are absolutely irresponsible.

Witchcraft cases present great difficulty from the medico-legal aspect. Can a person under the influence of such be accounted as sane or insane? Here is a case. An adult Kikuyu native was charged with murder. From the evidence it appeared that a witch doctor put a spell on him that he would kill the first man he met. The man got the spell removed, but without him being aware, the witch doctor put on a stronger spell. The man going along the road met an old man with a spear. He took the spear from the old man, who was a stranger to him, and inflicted fatal injuries. An interesting admission was one of General Paralysis in a Swahili. He was found stealing kitchen utensils from a house in broad daylight. On being taken in front of a Magistrate he was found to be insane. He was a typical General Paralysis in an advanced stage. A Wasserman reaction was done on his spinal fluid and found strongly positive. He died in about three months after admission, and his brain gave evidences of General Paralysis, but not very pronounced. General Paralysis is supposed to be practically unknown among natives.

Though supposed to be caused by syphilis there are other factors, and it seems to be in civilised communities, and there mostly in thickly populated centres, that it is most common. I have seen no cases among the up-country tribes, though syphilis is very common. All the cases come from the Swahilis, who have been civilised, or at least semi-civilised, for generations.

EUROPEAN ADMISSIONS.

Seven were admitted, of whom three were military. Two were re-admissions, one having been in for ten days in 1915, and the other admitted for the second time during the year. One military case, with delusions of persecution, had been several times in asylums in South Africa. Only one female was admitted, a French woman, who was suffering from dementia with extreme loss of memory.

ASIATIC ADMISSIONS.

Indians—Males 4, Females 1.
Goans—Male 1.

One Indian was a re-admission, who was admitted with acute amentia. His friends took him away too early, and he came back in about a fortnight. He made a good recovery. The only female case is a case of simple mania, who gets unmanageable at home.

DISCHARGES.

40 were discharged cured, and 12 improved.
The ratio of discharge to admission was 54·1%.

1917.	1916.	1915.
60%	41·1%	68·4%

DEATHS.

There were 43 deaths, of which Influenza accounted for 10. The death-rate is very high this year, but the patients are admitted very debilitated and do not seem to pick up. The ratio of deaths to admissions was 44·7%, and to total number resident during the year, 27·1%.

				Deaths.	Percentage of Admission.	Percentage of Total.
1917	...	...	...	19	23·1	13·4
1916	...	...	...	28	31·	22·9

The death-rate is very high, but considering everything cannot be wondered at—overcrowding, no hospital ward, dark dismal cells, all play their part in the high death-rate. All is done that can be done for the patients, but the adverse factors are too much, combined with the fact that the Medical Officer cannot give enough time for the proper treatment of the patients.

GENERAL.

A bungalow has been erected for female European patients. Both the male and female native quarters are very badly overcrowded.

A new male European block was to be erected, but the money was taken for something else. Owing to the lack of rain the crops on the asylum grounds were very poor.

STAFF.

The European staff consists of the Superintendent and his wife, who acts as Matron. An assistant Matron is on her way from England. Male attendants are badly wanted, but are difficult to get. The Superintendent has to be on the spot practically all the time, which is too much of a tie, especially considering the trying work he has to do. We should have European attendants for European patients. The European patients, when they have enough sense to realize, absolutely detest being followed about or given orders by a native, and bitterly complain about it. The menial staff is the same as in previous years, and with the exception of the head boy, of poor material.

ESCAPES.

One African, male.

4.—GOVERNMENT DENTAL SURGERY, NAIROBI.

Dr. V. G. L. van Someren reports that the period under review has been marked by many interruptions in the general routine work, such as illness, etc., so that allowing for days off duty, local leave, travelling, etc., a very limited time was available for consecutive work. An analysis shows a total of 242 days on which patients were attended to, and of this time no less than 115 days were spent out of Headquarters.

The Dental Surgeon draws attention to the fact that his work in Nairobi, at which centre it is heaviest and most important, is severely handicapped by the frequent official visits to outstations. Thus on many occasions important work is interrupted and much inconvenience and delay is caused.

An innovation during the year was the visits to Eldoret, undertaken at the urgent request of the large white community of the Plateau, and with the sanction of Government. During these visits 234 patients were attended to, thus saving them a considerable amount of money which would have been spent on train fares, hotel expenses, etc., had they travelled to Nairobi.

The following outstations were visited twice during the year :—

Mombasa, Kisumu, Nakuru, Fort Hall and Eldoret.

Owing to illness the third visit to these stations as allowed for in the Time-table had to be cancelled.

TABLE 1.

Working days ...		...	242
European Officials' Wives and Families attended to ...	...	...	1,128
Non-European Officials ...	...	...	29
Total ...		...	1,157

The Dental Surgeon is not in a position to treat Non-European Officials unless urgent cases, and in view of the fact that such Officials require dental treatment to an even greater extent than do Europeans, it is recommended that an Assistant Dental Surgeon be appointed for this work.

TABLE NO. 2.—TREATMENTS.

The following treatments were given :—

Extractions	...	...	...	...	...	168 recorded.
Conservative Work :—						
Plastic Fillings	...	..	...	...	...	918
Gold Fillings	...	...	...	...	...	12
Temporary Fillings	...	...	...	...	...	30
Root Fillings	...	...	...	...	...	120
Prosthetic Work :—						
Crowns,						
Gold	...	..	}	...	...	39
Porcelain	...	...		
Other kinds	...	...		
Bridges	...	...	...	...	...	4
Dentures :—						
Gold	...	...	...	...	...	3
Vulcanite	...	..	...	...	...	52
Repairs	...	..	...	...	...	66

5.—GAOLS.

A review of the work of the Prison hospitals is not satisfactory, when it is considered that, to take one example, the hospital at the Nairobi gaol, of 18 beds, is continually overcrowded, and at one time 90 patients had to be dealt with, with latrine accommodation sufficient for 20. Efforts have been made to provide tent extension, and an improved native staff other than convicts is under consideration.

1918 was a year of excessive ill-health amongst the prisoners, attributable to causes noted elsewhere.

TABLE SHOWING SICK AND DEATH RATES AMONGST PRISONERS AT THE MOMBASA, NAIROBI AND KISUMU GAOLS.

	Mombasa.		Nairobi.		Kisumu.	
	1918.	1917.	1918.	1917.	1918.	1917.
Total number of prisoners on 1st January	235	184	767	784	117	123
Number admitted during year	484	409	2,623	2,243	514	426
Average daily number in gaol	257	195	717	635	125	91
Total number placed on sick list	361	381	1,430	803	348	164
Total number of days on sick list	3,556	2,863	15,784	14,143	5,515	1,217
Average number sick daily	9.74	7.84	43.24	38.75	15.11	3.33
Total number of deaths	9	7	206	57	33	6
Percentage of deaths to average daily strength	3.50	3.59	28.73	8.98	26.40	8.79

The principal causes of admissions were :—

Dysentery.—381 cases with 57 deaths. It was especially prevalent in the Nairobi gaol. 78 cases last year.

Influenza.—358 cases with 28 deaths. Mombasa gaol only had four cases.

Beri-beri.—18 cases contracted in Jubaland.

Malaria.—339 cases with six deaths. The previous year recorded 225 admissions.

Pneumonia.—265 cases with 85 deaths, as against 122 and 33 deaths last year. 76 of the deaths occurred in Nairobi.

Diarrhœa.—102 admissions with 13 deaths.

Local injuries.—78 admissions.

No case of a European prisoner was sent to hospital during the year.

The causes of deaths during the year were as follows :—

Cerebro-spinal-meningitis	...	...	...	2
Chicken-pox	...	...	...	2
Small-pox	...	...	...	31
Dysentery...	...	...	...	57
Malaria ...	...	...	...	6
Influenza...	...	...	...	28
Pneumonia	...	...	...	83
Tuberculosis	...	...	...	2
Syphilis ...	...	...	...	1
Bronchitis	...	...	...	4
Diarrhœa	...	...	...	13
Nephritis...	...	...	...	1
Abcess (liver)	...	...	...	2
Other causes	...	...	...	16
Total				248

RETURNS.

TABLE I.

ADMINISTRATIVE DIVISION.

Dr. A. D. Milne, C.M G.	...	Principal Medical Officer.
Dr. J. A. Haran, C.M.G.	...	Deputy Principal Medical Officer.
Mr. R. Stanley ...	...	Office Superintendent.
Mr. T. Preston ...	...	Clerk.
Mr. J. D. Nightingale ...	...	"
Mr. J. S. Robertson ...	...	Medical Storekeeper.

MEDICAL DIVISION.

Dr. W. Owen-Prichard...	...	Senior Medical Officer.	
Dr. C. L. Chevallier ...	...	"	"
Dr. F. L. Henderson ...	...	Medical Officer.	
Dr. J. O. Shircore ...	...	"	"
Dr. G. R. H. Chell ...	...	"	"
Dr. T. F. Lumb ...	...	"	"
Dr. J. L. Gilks ...	...	"	"
Dr. J. Pugh ...	...	"	"
Dr. C. J. Wilson ...	...	"	"
Dr. V. G. L. van Someren	...	Dental Surgeon.	
Dr. N. P. Jewell ...	...	Medical Officer.	
Dr. A. D. J. B. Williams	...	"	"
Dr. T. H. Massey ...	...	"	"
Dr. P. F. Nunan ...	...	"	"
Dr. J. H. Thomson ...	...	"	"
Dr. H. R. A. Philp ...	...	District Surgeon.	
Dr. H. F. Hamilton ...	...	Medical Officer	Temporarily seconded from the West African Medical Service.
Dr. P. A. Clearkin ...	...	"
Mr. H. Ogden ...	...	Dispenser.	
Mr. F. Cribb ...	...	"
Miss F. L. Neave ...	...	"
Mrs. E. R. Brown ...	...	Matron.	
Miss H. H. Whitburn ...	...	Nursing Sister.	
Miss L. Merryweather ...	...	"	"
Miss R. Paul ...	...	"	"
Miss I. Wilson ...	...	"	"
Mrs. S. J. Harrison ...	...	"	"
Miss A. E. Hobson ...	...	"	"
Miss A. E. Drewe ...	...	"	"
Miss P. R. di Menna ...	...	"	"
Miss H. G. Tyrell ..	...	"	"
Mr. W. Henfrey ...	...	Supt., Lunatic Asylum.	
Mrs. L. A. Henfrey ...	...	Matron, Lunatic Asylum.	

TABLE I.—*continued.*

SANITATION DIVISION.

Dr. W. J. Radford	...	...	Principal Sanitation Officer.
Dr. A. R. Paterson	...	..	M. O. H., Mombasa.
Mr. A. F. Dennett	...	...	Sanitary Inspector.
Mr. B. E. F. Wetkin	...	...	" "
Mr. E. E. Williams	...	..	" "
Mr. F. Strawbridge	...	...	" "
Mr. P. Cairns	...	...	" "
Mr. J. P. Cook	...	...	" "
Mr. E. Holness	...	...	" "
Miss M. A. Thomlinson	...	...	Nurse attached to Health Office, Mombasa.

TABLE II.

FINANCIAL.

The sanctioned Medical Budget for the year 1918–19 was a total of £78,989, as compared with £60,086 for the preceding year.

Of the 1918–19 grand total, £53,240. 9s. 4d. was expended, leaving an unexpended sum of £25,748. 10s. 8d.

The saving was chiefly due to appointments provided for not being able to be filled, curtailment of leave and other matters due to the general upset resulting from war conditions.

The headings under which the vote was arranged were as follows :—

SCHEDULE XIV.—MEDICAL DEPARTMENTS.

	Estimate.	Actual Expenditure.		
	£	£	s.	d.
ADMINISTRATIVE DIVISION.				
Personal Emoluments	3,674	3,268	5	4

(Under this heading are included the salaries and any duty allowances granted, of the Principal Medical Officer, Deputy Principal Medical Officer, Office Superintendent, Medical Storekeeper, Clerical establishment, messengers and packers.)

Other charges	5,980	2,396	4	0
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(Under this heading are included Medical and Surgical Stores disinfectants and books, contingencies, transport : passages, local travelling, travelling allowances ; carriage of goods, typewriter and Contribution to the African Medical and Sanitary Advisory Committee.)

MEDICAL DIVISION.

Personal Emoluments	28,514	21,339	16	0
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(Under this heading are included the salaries and any duty allowances granted, of the Senior Medical Officers, Medical Officers, Dispensers, Nurses, Superintendent, Warders, Matron and Assistant Matron Lunatic Asylum, Assistant Surgeons, Sub-Assistant Surgeons, Hospital Compounders, Native Hospital Attendants and Lunatic Asylum Attendants.)

TABLE II.—*continued.*

SCHEDULE XIV.—MEDICAL DEPARTMENTS—*continued.*

							Estimate.	Actual Expenditure.		
							£	£	s.	d.
Other charges	...	...	...	...	...	...	10,798	9,059	4	0

(Under this heading are included upkeep of European and Native Hospitals, Lunatic Asylum, transport : passages, local travelling, travelling allowances ; ration allowances to Medical Subordinates in Northern Frontier District and Serenli, uniforms for Medical Staff, furniture and equipment for hospitals, typewriters, conservancy rates, fees and expenses of Medical Officers attending courses of instruction in England, electric lighting and water supply of hospitals.)

SANITATION DIVISION.

Personal Emoluments	17,507	8,019	1	4
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(Under this heading are included the salaries and any duty allowances granted, of the Principal Sanitation Officer, Medical Officers of Health, Sanitary Inspectors, Nurses, Assistant and Sub-Assistant Surgeons, Hospital Compounders, Vaccinators, Native Attendants for Infectious Diseases Hospitals, Leper Lazaretto and Quarantine stations, clerical establishment, mechanics for Clayton disinfectors, office, gharri and boat boys.)

Other charges	11,253	9,157	18	8
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(Under this heading are included epidemics, Sanitary station, Zanzibar ; transport : passages, local travelling, travelling allowances, typewriters, maintenance of Infectious Diseases Hospitals, bush clearing, mosquito and sleeping sickness preventive measures, contingencies, ration allowances, furniture and equipment for Infectious Diseases Hospitals and Quarantine Stations, ambulance services, upkeep of disinfectors, uniforms, Microscopes and Subsidy to Medical Mission, Kikuyu.)

Special Expenditure	1,200	...		
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(Purchase of three disinfectors.)

REVENUE.

The total amount of revenue collected as hospital fees, sales of medicines and surgical stores, bills of health and registration fees, was as follows :—

					£	s.	d.
Hospital fees	...	...	...	...	2,001	13	4
Sales of medicines	...	...	...	...	451	0	0
Bills of Health	...	...	...	...	366	0	0
Registration Fees	...	...	...	...	6	10	0
TOTAL					£2,825	3	4

Last year the total revenue collected amounted to £1,840. 17s. 4d.

TABLE III.

RETURN OF STATISTICS OF POPULATION FOR THE YEAR 1918.

EAST AFRICA.						Europeans and Whites.	Africans and Others.	Asiatics.
Number of Inhabitants in 1918	...	...	...	...	...	9,315	3,000,000*	22,451
Number of Births registered in 1918	...	...	...	...	...	140	... †	... †
Number of Deaths registered in 1918	...	...	...	...	...	84	... †	... †
Number of Immigrants during 1918	...	...	...	...	...	974	673‡	4,464
Number of Emigrants during 1918	...	...	...	...	...	851	72	3,914
Number of Inhabitants during 1917	...	...	...	...	...	8,201	3,000,000	21,901
Increase	...	...	...	...	...	1,114	...	550
Decrease	...	...	...	...	...	...	...	...

* Approximately. † Not registered. ‡ Includes Seychelles, Mauritians, etc.

N.B.—The last census taken was in 1911, and the number of European and Asiatic inhabitants shown in this table is not, therefore, very reliable.

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN OF NAIROBI.

FOR THE YEAR ENDING 31ST DECEMBER, 1918. DATE 14TH FEBRUARY 1919.

					Approximate Area.	Number of proclaimed Open Spaces.				
1916	...	...	...	...	7 square miles	Public Park and Municipal Forest.				
1917	...	...	...	...	7 " "	"	"	"	"	"
1918	...	...	...	...	7 " "	"	"	"	"	Jeevanjee Garden Arboretum and Show Ground, Parklands.

2.—POPULATION.

				Number of Natives.		Number of Europeans.		Total. Approx.
				Males.	Females.	Males	Females.	
1916	...	...	}	No estimate possible.		No estimate possible.		No estimate possible.
1917	...	...				
1918	..	..				

3.—HOUSING.

				Number occupied by Europeans.	Number occupied by Natives and Asiatics.
Number of Houses :—					
1916	...	...	...	428	582
1917	...	...	...	438	622
1918	...	...	...	524	335 Asiatics only.

Number of Huts :—

1916	...	...	1,548	Approximately.
1917	...	...	1,500	"
1918	...	..	1,475	"

TABLE IV.—*continued.*

4.—MOSQUITO PROTECTION OF HOUSES.

	1916.	1917.	1918.
Number of European houses wholly mosquito-protected ...	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of European houses with mosquito room ...	”	”	”
Number rendered during the year wholly mosquito-protected	”	”	”
Number rendered during the year partially mosquito-protected	”	”	”

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1916.	1917.	1918.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings ...	1	...	1
Number of houses erected with sanction as to site, construction, and relation to other buildings ...	27	47	37
Number of huts erected with sanction as to site, construction, and relation to other buildings ...	15	...	2
Number of houses built without sanction ..	5	...	1
Number of huts built without sanction ...	...	...	3

ACTION TAKEN.

	Number of Prosecutions.		Number Demolished.	
	Huts.	Houses.	Huts.	Houses.
1916 ...	5	5	100	4
1917 ...	...	...	...	...
1918 ...	3	1	2	...

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1916 ...	2	1	1
1917 ...	2	1	1
1918 ...	2	1 paved and 1 undrained.	1

7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1916 ...	1	1	...
1917 ...	2	2	...
1918 ...	2	2	...

TABLE IV.—*continued.*

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—			European.	
1916	26	210	1	2
1917	28	226	1	2
1918	26	212	...	...
Number of new public latrines erected during the year :—				
1916	1	8	...	...
1917	2	16	...	...
1918 ... ..	...	...	...	...
Number of public latrines repaired during the year :—				
1916 ... ..	...	...	...	...
1917	4	64	...	...
1918	5	40	...	...
Number of public latrines demolished during the year :—			European.	
1916 ... ..	...	...	...	...
1917 ... ..	...	...	...	...
1918	2	14	1	2

	1916.	1917.	1918.
Number of private latrines	2,372	2,482	2,223
Average number of pails of night-soil daily removed... ..	2,372	2,482	2,432
Average number of soiled pails removed and clean pails substituted ... ..	...	...	...
Number of night-soil men employed to clean latrines and to remove excreta	87	91	99
Number of cesspools	9	5	1
Number of cesspools cleaned	9	5	1
Number of new cesspools constructed during the year ... ..	...	...	...
Number of old cesspools abolished	46	4	4
Number of cesspools oiled regularly by Department ... ..	...	...	...

9.—REMOVAL OF REFUSE.

	1916.	1917.	1918.
Number of dustbins	1,310	1,381	1,400
Number of carts at work daily to remove refuse from streets	10 (including 12	10 sludge carts)	12 (including 8 sludge carts)
Amount of refuse removed daily	20 (including 12	20 sludge loads)	24 (including 16 sludge loads)
Number of carts at work daily to remove refuse from yards and premises	19	22	22
Amount of refuse removed daily from yards and premises	36	40	40 loads
Number of men employed for removing refuse	83	88	90

TABLE IV.—*continued.*

10.—MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of slaughter- house and market offal.		
	1916.	1917.	1918.	1916.	1917.	1918.	1916.	1917.	1918.
Buried or trenched	2,576	2,710	2,436	...	...	...	6	6	2
Burnt ... ..	...	...	...	44	44	44	1	1	1
Thrown into sea ... ..	...	...	...	...	...	...	...	...	...
Otherwise dealt with ... ..	...	...	...	...	...	...	...	...	...

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

	1916.	1917.	1918.
Cartloads	20	20	20

12.—WATER SUPPLY.

Nature of Water Supply.	1916.	1917.	1918.
Pipe-borne water :—			
Source (river, lake or spring)—	River and Spring	River and Spring.	River and Spring.
Number of linear yards	510,698	514,326	518,897
Number of standpipes along roads	53	53	...
Number of standpipes in compounds and houses ...	1,030	1,140	1,241
Wells :—			
Public—			
Number	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number with pumps protected against surface water and mosquito-protected	"	"	"
Private—			
Number	"	"	"
Number with pumps protected against surface water and mosquito-protected	"	"	<i>Nil</i>
Tanks :—			
Public—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected and served by pumps ...	"	"	"
Number above ground	"	"	"
Number mosquito-protected	"	"	"
Number of 400-gallons capacity or less	"	"	"
Number above 400 gallons	"	"	"
Private—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected	"	"	"
Number above ground... ..	155	155	155
Number mosquito-protected	155	155	155
Number of 400-gallons capacity or less	43	43	43
Number above 400 gallons	112	112	112
Nature of tanks :—			
Wood	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iron	155	155	155
Concrete	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Barrels :—			
Number	150	150	150
Number mosquito-protected	140	140	140

TABLE IV.—*continued.*

13.—DRAINAGE.

	Public.	Private.
Masonry Drains—		
Linear yards of masonry drains—		No information
1916	31,905	
1917	35,939	"
1918	36,497	"
Linear yards reconstructed during the year—		
1916	<i>Nil</i>	"
1917	"	"
1918	"	"
Linear yards repaired during the year—		
1916	500	"
1917	—	"
1918	—	"
Linear yards of new drains constructed during the year—		
1916	6,052	"
1917	4,034	"
1918	558	"
Earth Drains or Ditches cleansed—		
Number of linear yards of ditches cleansed—		
1916	67,722	"
1917	78,170	"
1918	135,227	"
Number of linear yards of ditches dug and graded—		
1916	6,000	"
1917	10,448	"
1918	135,227	"
Average frequency of clearing ditches of grass—		
1916	When necessary	"
1917	"	"
1918	"	"

14.—CLEARANCE OF UNDERGROWTH, LONG GRASS
AND JUNGLE.

	1916.	1917.	1918.
Number of square yards of weeds, grass and vegetation cut and removed	13,319,680	19,998,720	17,613,000
Average frequency of clearance of rank vegetation on same area	When necessary	When necessary	When necessary

15.—EXCAVATIONS OF LOW-LYING LAND.

	1916.	1917.	1918.
Number of pools and excavations	20	34	36
Number of excavations filled up	334	61	27
Amount of low-lying and marsh land raised and drained	2 acres	2 acres	1½ acres
Number of pools, marshes, etc., fish-stocked ... ..	...	...	...
Number of cubic yards of material used for filling up pools and excavations	No information	No information	No information
Number of persons fined for making new excavations	2	...	...
Average number of men daily employed in filling up pools, etc.	No fixed number	12	20

TABLE IV.—*continued.*

16.—OILING.

	1916.	1917.	1918.
Number of drains oiled	All mosquito breeding places are either removed or disinfected.		
Number of pools and excavations oiled ... ..	...	...	208
Number of tanks and barrels oiled ... ..	...	...	96
Average number of men daily employed for oiling drains, pools and water-tanks or barrels	4	12	12

17.—INSPECTIONS AND PROSECUTIONS.

	1916.	1917.	1918.
Number of Inspectors employed	2	3	3 and one at the Railway area.
Number of houses inspected	8,766	7,502	7,918
Number of houses where larvæ were found	312	92	573
Number of notices served to remove conditions causing the breeding of larvæ	480	944	629
Number of persons fined for having mosquito larvæ on premises	1	2	5
Number of notices served to remove insanitary conditions on premises	924	1,256	836
Number of persons fined for not removing insanitary conditions after notice	38	32	38
Number of soda and aerated water factories inspected	4	4	5

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN OF MOMBASA.

FOR THE YEAR ENDING 31ST DECEMBER, 1919.

	Approximate Area.	Number of proclaimed Open Spaces.
1916... ..	Island = 3,400 acres and approximately 5,500 acres on mainland.	1 public garden.
1917... ..		
1918... ..		

2.—POPULATION.

			Number of Natives.		Number of Europeans.		Total Approx.
			Males.	Females.	Males.	Females.	
1916	...	...	7,862	12,458	189	38	
1917	...	...	7,611	12,501	173	35	20,320
1918	...	...	14,416	15,267	162	39	29,884

TABLE IV.—*continued.*

3.—HOUSING.

		Number occupied by Europeans.	Number occupied by Natives and Asiatics.
Number of Houses :—			
1916	... ..	110	1,127
1917	... ..	110	1,013
1918	... ..	110	600-700

Number of huts :—

1916	... ..	3,553
1917	... ..	3,339
1918	... ..	3,541

4.—MOSQUITO PROTECTION OF HOUSES.

	1916.	1917.	1918.
Number of European houses wholly mosquito-protected ...	} <i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of European houses with mosquito room			
Number rendered during the year wholly mosquito-protected			
Number rendered during the year partially mosquito-protected			

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1916.	1917.	1918.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of houses erected with sanction as to site, construction, and relation to other buildings	19	14	29
Number of huts erected with sanction as to site, construction, and relation to other buildings	240	242	192
Number of houses built without sanction	<i>Nil</i>	<i>Nil</i>	1
Number of huts built without sanction	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

ACTION TAKEN.

				Number of Prosecutions.		Number Demolished.	
				Huts.	Houses.	Huts.	Houses.
1916	... ..			1	7	63	8
1917	... ..			<i>Nil</i>	<i>Nil</i>	214	21
1918	... ..			<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

TABLE IV.—continued.

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1916	3	2	1
1917	3	2	1
1918	2	2	<i>Nil</i>

7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1916	2	2	...
1917	2	2	...
1918	2	2	...

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—				
1916... ..	17	40	3	5
1917... ..	20	52	3	5
1918... ..	41	177	...	11
Number of new public latrines erected during the year :—				
1916... ..	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
1917... ..	3	12	„	„
1918... ..	4	14	„	„
Number of public latrines repaired during the year :—				
1916... ..	} <i>Nil</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
1917... ..				
1918... ..				
Number of public latrines demolished during the year :—				
1916... ..	6	49	<i>Nil</i>	<i>Nil</i>
1917... ..	<i>Nil</i>	<i>Nil</i>	„	„
1918... ..	2	...	...	...

	1916.	1917.	1918.
Number of private latrines :—			
Average number of pails of nightsoil removed daily	180	180	306
Average number of soiled pails removed and clean pails substituted	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of nightsoil men employed to clean latrines and to remove excreta	} 17	24	{ 23 { <small>by Conservancy</small>
Number of cesspools	5,917	5,928	32 { <small>by Railway</small>
	Approx.	Approx.	Some thousands
Number of cesspools cleansed	126	68	69
Number of new cesspools constructed during the year	278	38	unknown
Number of old cesspools abolished	63	22	10
Number of cesspools oiled regularly by Department	<i>Nil</i>	<i>Nil</i>	122

TABLE IV.—*continued.*

9.—REMOVAL OF REFUSE.

	1916.	1917.	1918.
Number of dustbins	220	220	57
Number of carts at work daily to remove refuse from streets	17	14	15
Amount of refuse removed daily	20 tons	20 tons	17 tons
Number of carts at work daily to remove refuse from yards and premises	1 trolley	1 trolley	1 trolley
Amount of refuse removed daily from yards and premises ...	1 ton	1 ton	1 ton
Number of men employed for removing refuse	164	180	146 { by Con- servancy 30 { by Railway

10.—MODE OF DISPOSAL OF EXCRETA, REFUSE AND OFFAL.

	Daily average number of Pails of Excreta.			Daily average number of Cartloads of Refuse.			Daily average number of Cartloads of Slaughter-house and Market Offal.		
	1916.	1917.	1918.	1916.	1917.	1918.	1916.	1917.	1918.
Buried or trenched ...	...	...	...	...	42	...	...	...	...
Burnt ... ..	...	...	231	42	...	...	...	...	...
Thrown into sea ...	180	301	180	...	...	...	Discharged direct into the sea.		
Otherwise dealt with ...	...	...	...	...	...	...	...	...	...

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

	1916.	1917.	1918.
	4	4	4

TABLE IV.—*continued.*

12.—WATER SUPPLY.

Nature of Water Supply.	1916.	1917.	1918.
Pipe-borne water—			
Source (river, lake, or spring)—	River.	River.	River.
Number of linear yards	15,131	...	25,094
Number of stand-pipes along roads	17	...	Kiosks 7
Number of stand-pipes in compounds and houses ...	41	...	144
			} Information not yet received from P.W.D.
Wells :—			
Public—			
Number	28	28	28
Number with pumps protected against surface water and mosquito-protected	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Private—			
Number	96	96	86
Number with pumps protected against surface water and mosquito-protected	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Tanks :—			
Public—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected and served by pumps ...	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number above ground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of 400 gallons capacity or less	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number above 400 gallons	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Private—			
Number underground	80	82	82
Number mosquito-protected	80	82	82
Number above ground	149	148	Unknown
Number mosquito-protected	149	148	Unknown
Number of 400 gallons capacity or less	105	105	Unknown
Number above 400 gallons	124	125	Unknown
Nature of Tanks :—			
Wood	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iron	149	148	Unknown
Concrete	80	82	82
Barrels :—			
Number	1,800 aprox.	1,600 aprox.	Unknown
Number mosquito-protected	60%	60%	Possibly 6% not more.

TABLE IV.—*continued.*

13.—DRAINAGE.

	Public.	Private.
Masonry Drains :—		
Linear yards of masonry drains :—		
1916	5,350	1,493
1917 ... ..	...	1,493
1918	Unknown.	Unknown.
Linear yards reconstructed during the year :—		
1916 ... ..	...	...
1917 ... ..	...	...
1918	35	...
Linear yards repaired during the year :—		
1916	35	...
1917 ... ..	...	...
1918	87	...
Linear yards of new drains constructed during the year :—		
1916	420	...
1917 ... ..	...	...
1918	190	500
Earth drains or ditches cleansed—Number of linear yards of ditches cleansed :—		
1916	4,920	...
1917	1,310	...
1918	Unknown.	...
Number of linear yards of ditches dug and graded :—		
1916	4,935	...
1917	1,160	...
1918	1,400	...
Average frequency of clearing ditches of grass :—		
1916 ... ..	...	...
1917	When necessary.	...
1918 ... ..	...	...

14.—CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

	1916.	1917.	1918.
Number of square yards of weeds, grass and vegetation cut and removed	1,497 ac's	782 acres.	1,030 acres.
Average frequency of clearance of rank vegetation on same area	When necessary.		

15.—EXCAVATIONS OF LOW-LYING LAND.

	1916.	1917.	1918.
Number of pools and excavations	27	4	Unknown.
Number of excavations filled up	11	Nil.	11
Amount of low-lying and marsh land raised and drained ...	850	90	$\frac{1}{8}$ acre.
	sq. yds.	sq. yds.	17
Number of pools, marshes, etc., fish-stocked	Nil.	Nil.	200
Number of cubic yards of material used for filling up pools and excavations	630	68	Nil.
Number of persons fined for making new excavations ...	Nil.	Nil.	Casual
Average number of men daily employed in filling up pools, etc.	7	7	labourers.

TABLE IV.—*continued.*

16.—OILING.

	1916.	1917.	1918.
Number of drains oiled	2	2	Nil.
Number of pools and excavations oiled	4	3	1
Number of tanks and barrels oiled	150	315	453
Average number of men daily employed for oiling drains, pools, and water tanks or barrels ... ..	...	...	6

17.—INSPECTIONS AND PROSECUTIONS.

	1916.	1917.	1918.
Number of European Sanitary Inspectors employed ...	2	2	2
Number of houses inspected	5,046	7,350	6,482
Number of houses where larvæ were found	477	2,242	No record.
Number of notices served to remove conditions causing the breeding of larvæ	307	402	408
Number of persons fined for having mosquito larvæ on premises	23	Nil.	Nil.
Number of notices served to remove insanitary conditions on premises	798	959	703
Number of persons fined for not removing insanitary conditions after notice	55	14	1
Number of soda and aerated water factories inspected	5	4	4

TABLE IV.

1.—SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN OF KISUMU.
FOR THE YEAR ENDED 31ST DECEMBER, 1918.

	Approximate Area.	Number of proclaimed Open Spaces.
1916	19·6 sq. miles	1
1917	19·6 sq. miles	1
1918	19·6 sq. miles	1

2.—POPULATION.

			Number of Natives.		Number of Europeans.		Total approx.
			Males.	Females.	Males.	Females	
1916	4,000	1,370	93	26	5,489
1917	..	{	Natives	Natives	101	38	6,810.
			3,950	1,650			
			Asiatics	Asiatics			
1918	...	{	794	277	96	30	6,273
			4,000	1,370			
			Asiatics	including			
			777	females			

TABLE IV.—*continued.*

3.—HOUSING.

	Number occupied by Europeans.	Number occupied by Natives and Asiatics.
Number of Houses :—		
1916	55	145
1917	56	145
1918	57	145

Number of Huts :—

1916	890
1917	890
1918	1,200

4.—MOSQUITO PROTECTION OF HOUSES.

	1916.	1917.	1918.
Number of European houses wholly mosquito-protected ...	11	18	19
Number of European houses with mosquito room	1	51	51
Number rendered during the year wholly mosquito-protected...	<i>Nil</i>	6	1
Number rendered during the year partially mosquito-protected	1	2	<i>Nil</i>

5.—ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1916.	1917.	1918.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of houses erected with sanction as to site, construction, and relation to other buildings	3	6	1
Number of huts erected with sanction as to site, construction, and relation to other buildings	?	?	39
Number of houses built without sanction	?	2	<i>Nil</i>
Number of huts built without sanction	?	?	„

ACTION TAKEN.

		Number of Prosecutions.		Number Demolished.	
		Huts.	Houses.	Huts.	Houses.
1916	81	<i>Nil</i>
1917	2	147	2
1918	2	<i>Nil</i>	<i>Nil</i>

Cattle Bomas 5. Shop addition 1.

6.—MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1916	1	1	<i>Nil</i>
1917	1	1	„
1918	1	1	„

TABLE IV.—*continued.*
7.—SLAUGHTER-HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1916	2	2	<i>Nil</i>
1917	2	2	<i>Nil</i>
1918	2	2	<i>Nil</i>

8.—LATRINES.

	For Males.		For Females.	
	Number.	Number of Seats.	Number.	Number of Seats.
Number of public latrines :—			Public latrines are only provided for Asiatics and Africans, and are used in common by males and females.	
1916... ..	15	117		...
1917... ..	16	123		...
1918... ..	16	123		...
Number of new public latrines erected during the year :—				
1916... ..	<i>Nil</i>	<i>Nil</i>		...
1917... ..	1	6		...
1918... ..	<i>Nil</i>	<i>Nil</i>		...
Number of public latrines repaired during the year :—				
1916... ..	2	<i>Nil</i>		...
1917... ..	<i>Nil</i>	<i>Nil</i>		...
1918... ..	2	2		...
Number of public latrines demolished during the year :—				
1916... ..	1	6		...
1917... ..	<i>Nil</i>	<i>Nil</i>		...
1918... ..	2	2		...

	1916.	1917.	1918.
Number of private latrines	288	301	308
Average number of pails of nightsoil daily removed	622	646	674
Average number of soiled pails removed and clean pails substituted... ..	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number of nightsoil men employed to clean latrines and to remove excreta	42	42	45
Number of cesspools	119	131	132
Number of cesspools cleaned	119	131	132
Number of new cesspools constructed during the year	<i>Nil</i>	13	1
Number of old cesspools abolished	<i>Nil</i>	1	<i>Nil</i>
Number of cesspools oiled regularly by Department	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

9.—REMOVAL OF REFUSE.

	1916.	1917.	1918.
Number of dustbins	470	379 { 351 iron with lids 28 open wooden tubs.	400
Number of carts at work daily to remove refuse from streets	6	6	4
Amount of refuse removed daily	36	36	40
Number of carts at work daily to remove refuse from yards and premises	10	10	10
Amount of refuse removed daily from yards and premises	30	30	36
Number of men employed for removing refuse	33	34	34

TABLE IV.--*continued.*

10.—MODE OF DISPOSAL OF EXCRETA, REFUSE, AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of slaughter- house and market offal.		
	1916.	1917.	1918.	1916.	1917.	1918.	1916.	1917.	1918.
Buried or trenched	622	646	674	22	22	22	1	1	1
Burnt	21	24	<i>Nil</i>	9	9	9	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Thrown into sea ... ..	...	...	...	...	...	...	...	...	...
Otherwise dealt with ... ..	...	...	...	35	35	31	1	1	1

11.—AVERAGE DAILY NUMBER OF CARTLOADS OF CANS, BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

	1916.	1917.	1918.
	3	3	3

12.—WATER SUPPLY.

Nature of Water Supply.	1916.	1917.	1918.
Pipe-borne water :—			
Source (river, lake or spring) —	Lake	Lake	Lake
Number of linear yards	12,000	12,000	12,543
Number of standpipes along roads	11	11	11
Number of standpipes in compounds and houses ...	72	72	81
Wells :—			
Public—			
Number	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number with pumps protected against surface water and mosquito-protected	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Private—			
Number ... ..	...	...	...
Number with pumps protected against surface water and mosquito protected	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Tanks :—			
Public—			
Number underground	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected and served by pumps ...	"	"	"
Number above ground	"	"	"
Number mosquito-protected	"	"	"
Number of 400 gallons capacity or less	"	"	"
Number above 400 gallons	"	"	"
Private—			
Number underground	"	"	"
Number mosquito-protected	"	"	"
Number above ground	193	194	195
Number mosquito-protected	Practically none.		Satisfactorily.
Number of 400 gallons capacity or less	63	64	64
Number above 400 gallons	130	130	131
Nature of Tanks :—			
Wood	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Iron	79	80	81
Concrete	114	114	114
Barrels :—			
Number	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>
Number mosquito-protected	"	"	"

TABLE IV.—*continued.*

13.—DRAINAGE.

	Public.	Private.
Masonry Drains :—		
Linear yards of masonry drains—		
1916	2,996	60
1917	6,260	267
1918	6,260	267
Linear yards reconstructed during the year—		
1916	Nil.	Nil.
1917	"	"
1918	"	"
Linear yards repaired during the year—		
1916	Nil.	Nil.
1917	"	137
1918	"	Nil.
Linear yards of new drains constructed during the year—		
1916	2,066	Nil.
1917	3,264	207
1918	Nil.	Nil.
Earth drains or ditches cleansed :—		
Number of linear yards of ditches cleansed—		
1916	40,000	Nil.
1917	19,890	"
1918	40,000	"
Number of linear yards of ditches dug and graded—		
1916	550	Nil.
1917	2,170	"
1918	Nil.	"
Average frequency of clearing ditches of grass—		
1916	monthly	...
1917	monthly	...
1918	monthly	...

14.—CLEARANCE OF UNDERGROWTH, LONG GRASS AND JUNGLE.

	1916.	1917.	1918.
Number of square yards of weeds, grass and vegetation cut and removed	84,450	869,480	90,000
Average frequency of clearance of rank vegetation on same area	quarterly	quarterly	as labour permits.

15.—EXCAVATIONS OF LOW-LYING LAND.

	1916.	1917.	1918.
Number of pools and excavations	Nil.	Nil.	Nil.
Number of excavations filled up... ..	11	8	1
Amount of low-lying and marsh land raised and drained ...	Nil.	3½ acres.	Nil.
Number of pools, marshes, etc., fish-stocked	Nil.	Nil.	Nil.
Number of cubic yards of material used for filling up pools and excavations	About 590	1,970	300
Number of persons fined for making new excavations... ..	Nil.	Nil.	Nil.
Average number of men daily employed in filling up pools, etc.	7	32	6

TABLE IV.—*continued.*

16.—OILING.

	1916.	1917.	1918.
Number of drains oiled	Nil.	Nil.	Nil.
Number of pools and excavations oiled	"	"	"
Number of tanks and barrels oiled	"	"	"
Average number of men daily employed for oiling drains, pools and water-tanks or barrels	"	"	"

17.—INSPECTIONS AND PROSECUTIONS.

	1916.	1917.	1918.
Number of Inspectors employed... ..	1	1	1
Number of houses inspected	2,844	13,308	14,010
Number of houses where larvæ were found	2	1	1
Number of notices served to remove conditions causing the breeding of larvæ	2	1	...
Number of persons fined for having mosquito larvæ on premises ... ..	...	...	...
Number of notices served to remove insanitary conditions on premises	312	277	53
Number of persons fined for not removing insanitary conditions after notice	13	45	...
Number of soda and aerated water factories inspected... ..	1	1	1

TABLE V.

METEOROLOGICAL RETURN FOR THE YEAR 1918.

GOVERNMENT LABORATORY, NAIROBI.

MONTH.	TEMPERATURE.						RAINFALL.			WINDS.		REMARKS.
	Solar Maximum.	Minimum in Shade.	Shade Maximum.	Shade Minimum.	Mean Range.	Mean.	Amount in inches.	Degree of Humidity.		General Direction.	Average Force.	
								9 a.m.	4 p.m.			
January	48·00	85·00	...	29·10	67·22	0·39	69·91	64·04	East	...	
February	50·09	84·50	...	27·73	67·45	0·00	73·26	70·93		...	
March	50·50	86·56	...	27·34	69·39	0·00	73·13	55·72		...	
April	54·00	86·00	...	18·25	67·23	7·59	79·18	71·19		...	
May	51·00	77·00	...	18·63	65·58	6·42	83·09	73·45		...	
June	45·00	77·50	...	17·55	62·87	0·86	82·40	76·05		...	
July	49·00	80·00	...	20·11	61·90	0·40	79·48	74·50		...	
August	43·50	78·00	...	19·00	62·76	0·00	77·23	65·74		...	
September	46·50	85·00	...	25·00	66·17	0·04	79·57	62·23		...	
October	49·00	83·50	...	23·29	68·15	3·33	74·61	57·74		...	
November	52·00	80·00	...	18·32	65·86	2·43	79·17	60·33		...	
December	50·00	80·00	...	19·51	65·94	2·15	76·19	54·94		...	
Year Average	...	43·50	86·50	...	21·96	65·87	23·61 Total.	77·27	65·50	...	...

TABLE V.—*continued.*
 METEOROLOGICAL RETURN FOR THE YEAR 1918.
 KABETE FARM, NAIROBI.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	Not recorded.	Not recorded.	78·0	46·0	...	62·0	0·14	59	N.E.	2	
February ...			79·0	48·0	...	63·5	0·15	64	N.E.	3	
March ...			80·0	49·0	...	64·5	0·51	74	N.E.	5	
April ...			73·0	54·0	...	63·5	9·85	88	N.E.	2	
May ...			70·0	53·0	...	61·5	4·92	84	N.E.	2	
June ...			68·0	52·0	...	60·0	1·25	85	S.E.	3	
July ...			68·0	50·0	...	59·0	0·88	83	S.E.	3	
August ...			70·0	49·0	...	59·5	0·00	80	S.	3	
September ...			75·0	49·0	...	62·0	1·43	78	N.E.	2	
October ...			77·0	54·0	...	65·5	3·42	76	N.E.	5	
November ...			73·0	53·0	...	63·0	3·00	81	N.E.	3	
December ...			73·0	53·0	...	63·0	3·18	79	N.E.	3	
Year Average	...	...	73·7	50·8	...	62·3	Total. 28·73	...	N.E.	...	

MOMBASA.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	Not recorded.	Not recorded.	83·0	72·0	...	77·5	0·00	70	Not observed.	Not observed.	
February ...			83·0	72·0	...	77·5	0·00	71			
March ...			86·0	74·0	...	80·0	0·00	65			
April ..			85·0	75·0	...	83·0	2·15	71			
May ...			82·0	72·0	...	77·0	6·74	78			
June ...			80·0	70·0	...	75·0	4·67	81			
July ...			78·0	69·0	...	73·5	6·92	82			
August ...			79·0	68·0	...	73·5	3·60	79			
September ...			79·0	68·0	...	73·5	3·45	80			
October ...			82·0	72·0	...	77·0	0·17	77			
November ...			84·0	73·0	...	78·5	4·77	78			
December ...			85·0	74·0	...	79·5	2·83	72			
Year Average	...	...	82·2	71·6	...	76·9	Total 35·30	...	...	...

TABLE V.—*continued.*METEOROLOGICAL RETURN FOR THE YEAR 1918—*continued.*

KISUMU.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	Not recorded.	Not recorded.	3.24	%	Not observed.	Not observed.	
February ...			...	...	...	...	2.54	Not recorded.
March ...			...	...	...	...	2.63	Not recorded.
April... ...			82.0	64.0	...	73.0	4.87	76			
May			82.0	64.0	...	73.0	4.83	66			
June			83.0	62.0	...	72.5	1.61	62			
July			83.0	62.0	...	72.5	1.33	66			
August ...			82.0	63.0	...	72.5	0.88	59			
September ...			85.0	63.0	...	74.0	2.08	57			
October ...			87.0	65.0	...	76.0	1.90	56			
November ...			87.0	66.0	...	76.5	3.07	61			
December ...			87.0	65.0	...	76.0	3.48	57			
Year Average	84.2	63.9	...	74.0	Total 32.46	

FORT HALL.

MONTH.	TEMPERATURE.						RAINFALL.		WINDS.		Remarks.
	Solar Maximum.	Minimum on grass.	Shade Maximum.	Shade Minimum.	Range.	Max. and Min. Mean combined.	Amount in inches.	Degree of Humidity.	General Direction.	Average Force.	
January ...	Not recorded.	Not recorded	82.0	56.0	...	69.0	0.70	%	Not observed.	Not observed.	
February ...			84.0	58.0	...	71.0	0.88	69			
March ...			84.0	59.0	...	71.5	0.00	66			
April... ...			77.0	61.0	...	69.0	14.69	85			
May			75.0	60.0	...	67.5	4.79	85			
June			74.0	59.0	...	66.5	1.37	82			
July			72.0	57.0	...	64.5	1.01	86			
August ...			74.0	56.0	...	65.0	0.38	85			
September ...			78.0	58.0	...	68.0	0.28	80			
October ...			83.0	61.0	...	72.0	3.71	80			
November ...			78.0	59.0	...	68.5	4.05	83			
December ...			79.0	58.0	...	68.5	4.03	82			
Year Average	78.3	58.5	...	68.4	Total 35.89	

TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1918.

DISEASES.	EUROPEAN OFFICIALS.				NATIVE OFFICIALS.				GENERAL EUROPEAN POPULATION.				GENERAL NATIVE POPULATION.			
	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Total cases treated.	Remaining in Hospital at end of 1918.	
		Admissions.	Deaths.				Admissions.	Deaths.				Admissions.	Deaths.			
INFECTIVE DISEASES :—																
Beri-beri	1	...	1	...	...	...	...	...	...	...	1	49	2	50	7
Cerebro-spinal fever	1	...	...	...	1	...	...	3	143	54	146	3
Chicken-pox	8	...	8	...	...	...	39	1001	9	1040	10
Cholera
Dengue	1	...	1	...	...	...	...	...
Diphtheria
Dysentery	1	49	...	50	1	...	202	2	202	2	...	29	5	29	1	123
Endocarditis—Infective...
Enteric fever	9	...	9	...	...
Erysipelas	1	...	1	...	...	...	...	...	...	...	...	4	1	...	...
Gonorrhœa...	1	...	1	...	12	...	12	...	...	...	11	157	1	168	7
Influenza	171	7	171	5	...	1104	13	1104	4	...	108	6	103	1	2886
Kala Azar
Leprosy (a) Nodular	13	14	3	27	7
(b) Anaesthetic	5	...	5	2
Malaria (a) Tertian	108	...	108	5	7	998	...	1005	5	...	76	...	76	1	816
(b) Quartan	2	...	2	...	643
(c) Estivo-autumnal	1	35	...	36	...	1	615	1	616	7	...	31	1	31	1	2012
(d) Chronic	1	...	1	...	...	2	1	...	3	...	65
(e) Blackwater	6	1	6	...	...	...	2	1	2	...	9
Measles	1	...	1	...	...	...	4	...	4	...	18
Malta fever
Plague	1	...	...	1	...	2	10
Pneumonia	6	1	6	1	1	34	9	35	1	...	14	5	14	1	1021
Rabies
Relapsing fever
Rheumatic fever	1	11	1	12	...	...	66	...	66	4	...	1	...	1	...	134
Septicæmia	2	...	2	...	...	...	...	...	...	...	...	...	...	2	2
Trypanosomiasis (Sleeping sickness)	1	...	1	...	...	...	...	...	...	...	...
Small-pox	3	...	3	...	1	1	1	...	...	...	8	2	8	...	968
Syphilis (a) Primary	3	...	3	...	...	...	1	...	1	...	55
(b) Secondary	1	...	1	...	5	...	5	...	...	...	...	...	...	3	96
(c) Inherited	4	1
Tetanus	3	4
Tuberculosis	2	...	2	1	...	5	1	5	...	...	5	2	5	1	72
Whooping cough	1	1
Yaws	67	1
Yellow fever
Mumps	9	...	...	233	...
Anthrax	2	...	2	...	1	...	1	...	...	...	...	...	...	6	2
Other Infective Diseases	1	...	1	...	1	...	1	...	...	...	...	...	...	35	1
INTOXICATIONS :—																
Alcoholism	2	...	2	...	...	...	...	...	...	...	3	1	3	...	...
Morphinism
Others
GENERAL DISEASES :—																
Anæmia	3	...	3	...	...	...	2	...	2	...	78
Anæmia—Pernicious	1	...	1	...	...
Diabetes	2	...	2	...	...	...	...	...	...	...	...
Exophthalmic goitre
Gout
Leucocythæmia
Hodgkin's disease
Myxœdema
Purpura
Rickets	2	...
Scurvy	154	16
Other General Diseases	33	...	33	2	...	24	...	24	...	...	16	...	16	3	123
LOCAL DISEASES :—																
Diseases of the Nervous System :—																
Sub-section 1.																
Neuritis	2	...	2	...	...	...	...	...	...	...	1	...	1	...	2
Meningitis	5	2
Myelitis	1	1
Hydrocephalus
Encephalitis
Abscess of brain
Congestion of brain
Other Diseases	1	2	...	3	...	...	...	...	...	...	4	...
Sub-section 2.																
Apoplexy	3	1
Paralysis	12	5
Chorea
Epilepsy	9	1
Neuralgia	4	...	4	...	29	...	29	2	...	...	5	...	5	...	54
Hysteria	2	...	2	...	1	...	1	...	...	...	...	...	...	2	...
Other Nervous Diseases	5	...	5	1	...	8	1	8	1	1	6	1	7	...	22
Sub-section 3.																
Mental Diseases—																
Idiocy	2	...
Mania	3	...	1	...	4	3	38
Melancholia	1	...	1	1	5
Dementia	1	...	1	...	9
Delusional insanity	3	...	3	...	...	...	...	...	...	...	2	...	2	...	10
Other Mental Diseases	2	...	2	...	1	2	...	3	...	1	27

TABLE VI.—RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1918—(contd.)

DISEASES.	EUROPEAN OFFICIALS.				NATIVE OFFICIALS.				GENERAL EUROPEAN POPULATION.				GENERAL NATIVE POPULATION.				
	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Remaining in Hospital at end of 1918.	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Remaining in Hospital at end of 1918.	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Remaining in Hospital at end of 1918.	Remaining in Hospital at end of 1917.	YEARLY TOTAL.		Remaining in Hospital at end of 1918.	
		Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.			Admissions.	Deaths.		
LOCAL DISEASES—continued:—																	
Diseases of the Eye—																	
Conjunctivitis	1	31	...	32	1	...	...	...	...	3	112	...	115
Keratitis	1	1	...	2	...	...	...	...	...	1	7	...	8
Ulceration of cornea	1	12	...	13	...	...	...	...	...	...	6	...	6
Iritis	3	...	3	...	...	...	...	...	...	4	...	4
Optic neuritis
Cataract...	1	...	1	...	...	...	...	...	...	3	...	3
Other Eye Diseases ...	1	1	...	2	...	18	...	18	...	2	...	2	...	1	21	...	22
Diseases of the Ear:—																	
Inflammation	8	...	8	...	1	...	1	...	1	14	...	15
Other Diseases	52	...	52	...	...	...	...	...	1	6	...	7
Diseases of the Nose																	
...	...	11	...	11	...	43	...	43	...	10	...	10	...	...	21	...	21
Diseases of the Circulatory System:—																	
Pericarditis	1	...	1	...	...	1	1	1
Endocarditis
Valvular, Mitral	4	...	4	...	...	8	2	8
„ Aortic	1	...	1	...	...	...	...	...	...	...	...	...
„ Tricuspid
„ Pulmonary	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Arterial sclerosis	3	...	3	...	...	...	...	...
Aneurism	4	...	4	...	...	...	...	...	...	...	...	...	...	2	1	2
Other Diseases ...	1	...	...	1	...	9	...	9	...	1	4	...	5	...	16	3	16
Diseases of the Respiratory System:—																	
Laryngitis	2	...	2	1	...	...	...	...	1	...	1	...	...	...	...	...
Bronchitis	27	...	27	1	3	453	1	456	9	...	14	...	14	...	15	463
Broncho-pneumonia	10	1	10	1	...	2	...	2	1	4	54	16
Abscess of lung	1	...	1
Gangrene of lung
Emphysema	3	...	3
Pleurisy ...	1	4	...	5	...	4	...	4	...	...	1	...	1	...	35	...	35
Empyema	1	...	1
Other Diseases...	...	4	...	4	...	1	43	1	44	3	...	2	...	2	...	47	6
Diseases of the Digestive System:—																	
Stomatitis	1	...	1	...	...	...	...	...	...	8	...	8
Caries of teeth...	1	25	...	26	...	1	...	1	...	12	...	12
Glossitis
Sore throat	7	...	7	...	...	22	...	22	...	3	...	3	...	26	...	26
Inflammation of tonsils	...	24	...	24	...	21	...	21	...	...	9	...	9	...	1	18	...
Gastritis	10	...	10	1	1	27	...	28	...	9	...	9	...	17	...	17
Ulceration of stomach	1	2	...	3	...	...	...	...
Hæmatemesis	1	...	1
Dilatation of stomach
Stricture of stomach
Dyspepsia	1	...	1	...	28	...	28	...	1	...	1	...	...	30	...	30
Enteritis	1	...	1	...	...	4	...	4	...	8	...	8
Appendicitis	2	...	2	...	2	...	2	...	1	5	...	6	...	4	...	4
Colitis	2	...	2	1	...	1	...	1	...	3	...	3	...	...	...	...
Ulceration of intestines
Sprue
Hernia	2	...	2	...	...	1	1	...	3	23	2	26
Diarrhoea	27	...	27	1	...	123	...	123	1	...	16	1	16	5	680	54
Constipation	11	...	11	...	...	2	...	2	...	37	...	37
Colic	2	...	2	...	60	...	60	...	...	1	...	1	...	93	...	93
Hæmorrhoids	3	...	3	...	11	...	11	...	...	2	...	2	...	13	...	14
Pancreatitis
Hepatitis (Acute)	...	4	...	4	2	...	3	...	3	...	2	...	2	1	12	1	12
Abscess	1	...	1	...	...	...	...	...	...	1	...	1	...	3	...	3
Cirrhosis	1	7	3	8
Jaundice	1	...	1	...	...	...	...	...	...	2	...	2	...	9	1	9
Peritonitis	1	...	1
Ascites	22	5	22
Other Diseases	...	11	...	11	...	38	1	38	...	11	...	11	...	3	44	10	47
Diseases of the Lymphatic System:—																	
Splenitis	1	12	...	13	...	...	...	...	...	2	53	1	55
Inflammation of lymphatic gland	...	3	...	3	...	9	...	9	...	...	...	...	...	3	44	...	47
Suppuration of lymphatic gland	4	...	4	...	...	...	...	...	2	18	...	20
Lymphangitis	2	...	2
Elephantiasis	7	2	7
Other Diseases	1	...	1	...	...	6	4	6
Diseases of the Urinary System:—																	
Acute nephritis	1	...	1	...	8	2	8
Bright's disease	...	2	1	2	...	...	...	...	...	...	2	1	2	...	9	3	9
Pyelitis
Calculus	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Renal colic	4	...	4	...	1	...	1	...	...	1	...	1	...	1	...	1
Cystitis	2	...	2	...	...	1	...	1	1	3	...	3
Vesical calculus	2	...	2	...	...	...	...	...	...	...	...	...
Suppression
Hæmaturia	3	...	3
Chyluria	1
Other Diseases...	2	...	2	...	...	...	...	...	...	8	1	8

TABLE VII.

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1918.

DISEASES.	EUROPEAN OFFICIALS.		NATIVE OFFICIALS (including Asiatics).		GENERAL EUROPEAN POPULATION (NON-OFFICIALS).		GENERAL NATIVE POPULATION.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Infective Diseases :—								
Beri-beri ... ..	...	...	...	...	...	...	29	...
Cerebro-spinal fever ... ..	...	...	...	...	...	...	5	...
Chicken-pox ... ..	...	...	...	...	1	...	459	9
Cholera ... ..	...	...	...	...	...	...	...	...
Dengue	1	...	...	...	1	...	...	...
Diphtheria ... ..	...	...	...	...	...	...	...	...
Dysentery	13	1	16	...	21	14	2,131	199
Endocarditis—Infective ... ..	...	...	...	...	...	...	...	...
Enteric fever	1	...	...	...	1	...	3	...
Erysipelas ... ..	...	...	...	...	1	...	5	3
Gonorrhœa	5	...	11	...	9	...	664	12
Influenza	22	...	82	...	163	105	7,566	1,436
Kala Azar ... ..	...	...	...	...	...	...	...	...
Leprosy (a) Nodular ... ..	...	...	...	...	...	...	...	...
(b) Anæsthetic ... ..	...	...	...	...	...	...	...	...
Malaria (a) Tertian	31	2	253	...	75	31	5,694	497
(b) Quartan ... ..	...	...	8	...	...	...	9	...
(c) Æstivo-autumnal	8	...	187	...	16	12	3,676	617
(d) Chronic malaria	3	...	1	...	6	2	422	19
(e) Blackwater ... ..	...	...	...	...	...	...	1	...
Measles ... ..	...	...	...	...	1	...	13	5
Malta fever ... ..	...	...	...	...	...	...	...	...
Plague ... ..	...	...	...	...	...	...	...	5
Pneumonia	1	...	10	...	15	6	105	11
Rabies ... ..	...	...	...	...	...	...	...	...
Relapsing fever ... ..	...	...	...	...	...	1	...	...
Rheumatic fever	6	...	18	...	4	3	985	163
Septicæmia ... ..	...	...	...	...	...	...	...	2
Trypanosomiasis (Sleeping Sickness) ... ..	...	...	...	...	...	...	...	...
Small-pox ... ..	...	...	...	...	...	...	289	38
Syphilis (a) Primary ... ..	...	...	...	...	4	...	196	45
(b) Secondary ... ..	...	...	...	...	4	...	244	63
(c) Inherited ... ..	...	...	...	...	...	...	25	10
Tetanus ... ..	...	...	...	...	...	...	...	...
Tuberculosis ... ..	...	...	...	...	...	2	64	24
Whooping cough ... ..	...	...	...	...	...	...	9	4
Yaws ... ..	...	...	...	...	...	...	192	66
Yellow fever ... ..	...	...	...	...	1	...	...	...
Mumps ... ..	...	...	...	...	1	...	184	4
Anthrax ... ..	...	...	...	...	...	...	5	1
Other Infectious Diseases ... ..	...	...	...	...	1	2	16	...
Intoxications :—								
Alcoholism	1	...	...	...	...	...	...	...
Morphinism ... ..	...	...	...	...	...	...	...	...
Others ... ..	...	...	...	...	...	2	...	...
General Diseases :—								
Anæmia	3	1	4	...	18	33	386	87
Anæmia—Pernicious ... ..	...	...	37	...	...	...	...	...
Diabetes ... ..	...	...	...	...	...	...	3	...
Exophthalmic Goitre ... ..	...	...	...	...	...	...	...	...
Gout ... ..	...	...	...	...	...	...	6	2
Leucocythæmia ... ..	...	...	...	...	...	...	...	...
Hodgkin's Disease ... ..	...	...	...	...	...	...	...	...
Myxœdema ... ..	...	...	...	...	...	...	...	...
Purpura ... ..	...	...	...	...	...	...	...	...
Rickets ... ..	...	...	...	...	...	...	3	...
Scurvy ... ..	...	...	...	...	...	...	69	...
Other General Diseases	18	4	18	...	35	34	227	7
Local Diseases :—								
Diseases of the Nervous System	23	5	113	...	21	37	2,717	172
Mental Diseases ... ..	...	...	...	...	...	1	10	2
Diseases of the Eye	6	...	30	...	14	11	2,419	665
" " Ear	7	1	27	...	24	4	972	186
" " Nose	21	...	120	...	8	10	563	63
" " Circulatory System	3	...	2	...	4	7	79	5
" " Respiratory System	42	1	252	...	65	31	10,834	809
" " Digestive System	137	4	515	...	175	143	13,687	1,801
" " Lymphatic System	2	...	13	...	3	3	708	77
" " Urinary System	1	...	2	...	4	3	81	3
" " Generative System	4	1	9	...	14	61	378	154
" " Organs of Locomotion	15	...	73	...	11	2	2,513	128
" " Connective Tissue	4	1	11	...	12	2	1,046	112
" " Skin	48	2	143	...	41	38	5,716	945
Injuries :—								
General	5	...	...	...	3	1	223	40
Local	41	...	106	...	52	13	16,543	1,666
Gun-shot wounds ... ..	...	...	...	...	...	...	...	...
Surgical Operations	4*	...	...	...	1*	...	...	...
Tumours ... ..	...	...	2	...	...	3	29	6
Malformations	1	...	...	...	1	...	1	2
Poisons	1	...	...	...	...	...	16	...
Parasites—Animal	11	...	9	...	12	8	1,729	960
TOTAL	485	23	2,072	...	850	625	83,949	11,120

* Recorded under respective Diseases.

TABLE VIII.
EUROPEANS.

RETURN OF INFECTIVE DISEASES TREATED AT THE VARIOUS HOSPITALS AND DISPENSARIES IN THE PROTECTORATE DURING 1918.

DISEASES.		Mombassa.	Malindi.	Lamu.	Kakoeni.	Voi.	Kismayu.	Mtindu.	Archer's Post.	Nairobi.	Kyambu.	Machakos.	Makindu.	Thika.	Fort Hall.	Nyeri.	Kitui.	Embu	Kisumu.	Kericho.	Mumias.	Nandi.	Naivasha.	Nakuru.	Eldoret.	Eldama Ravine.	Kacheliba.	Total.
Beri-Beri	... { Cases Deaths	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Small-pox	... { Cases Deaths	4	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
Anthrax	... { Cases Deaths	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Chicken-pox	... { Cases Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Dysentery	... { Cases Deaths	21	1	1	...	...	6	...	...	4	2	1	...	...	5	...	1	...	...	...	...	...	...	...	...	...	...	127
Enteric Fever	... { Cases Deaths	3	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
Malaria	... { Cases Deaths	120	8	8	1	1	17	8	6	85	...	5	8	...	14	6	1	...	...	...	...	...	2	31	69	3	...	439
Blackwater Fever	... { Cases Deaths	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Measles	... { Cases Deaths	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2
Mumps	... { Cases Deaths	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Tuberculosis	... { Cases Deaths	2	...	...	...	...	1	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9
Influenza	... { Cases Deaths	29	...	1	1	...	...	...	1	143	4	3	1	2	2	51	...	...	...	...	...	...	...	...	...	...	...	569
Pneumonia	... { Cases Deaths	4	...	...	...	...	1	...	...	12	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13
		2	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42
			...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6

N.B.—This Table only gives the numbers *actually* treated at Government Institutions.

TABLE VIII.

NATIVES (INCLUDING ASIATICS).

RETURN OF INFECTIVE DISEASES TREATED AT THE VARIOUS HOSPITALS AND DISPENSARIES IN THE PROTECTORATE DURING 1918.

DISEASES.										Mombasa.	Voi.	Malindi.	Kakonehi.	Lamu.	Kismayu.	Mfudu.	Moyale.	Archer's Post.	Nairobi.	Machakos.	Makindu.	Kyambu.	Fort Hall.	Nyeri.	Embu.	Meru.	Kitui.	Kisumu.	Mumias.	Kericho.	Nandi.	Naivasha.	Nakuru.	Eldoret.	Eldama Ravine.	Kacheliba.	Kabarnet.	Total.	
Beri-beri	...	...	...	...	...	...	...	...	...	18	...	...	...	...	...	...	...	...	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	78 2
Cerebro-spinal meningitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50 27	1	...	...	...	...	...	...	2 2	19 11	...	...	...	...	...	...	...	...	...	148 54
Chicken-pox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	723	15	1	...	...	...	...	...	13	152 5	38	37	...	...	...	...	...	...	1,477 9	
Dysentery	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,767 110	155	172	32	65	91	111	64	34	317 49	134 3	33	62	29	572	59	22	64	11	4,436 370
Enteric fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9 2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9 2
Influenza	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,829 27	894	102	253	380	936	119	1,100	174	807 37	137 6	835 8	174	207	741	223	514 14	17	127	13,074 433
Leprosy	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	1	...	...	...	...	...	3	...	...	...	...	...	...	...	...	19 3
Malaria	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,488 18	248	275	90	505	350	264	275	296	2,114 3	222	381	160	61	535	101	155	239	101	16,533 41
Blackwater fever	1	3	2	16 4
Measles	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	1	...	...	...	...	...	...	...	2	...	5	...	...	...	...	...	...	...	37 —
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10 6
Pneumonia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	618 217	3	6	8	38	4	...	...	4	74 25	17	21	...	...	...	...	...	...	...	1,181 328
Small-pox	821 253	113	6	7	...	29	3	168 54	2	22	1,296 352
Tuberculosis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42 4	...	...	1	8	1	...	...	...	...	5	...	...	...	...	...	...	...	...	165 27
Yaws	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	...	1	7	43	20	...	62	1	79	1	7	...	...	...	...	...	...	...	325 1
Mumps	390	3	2	5	421 —
Anthrax	7 1	5	1	13 2

APPENDIX I.

INTESTINAL WORM INFECTIONS OF THE NYANZA PROVINCE.

BY N. P. JEWELL, M.D.

A series of examinations of the stools of natives at the Native Civil Hospital, Kisumu, and at the Kisumu Gaol, were carried out during 1918.

Five slides were made of each stool under examination, and two hundred examinations were made in all.

At the start, for a short time, I had the advantage of the assistance of Captain A. R. Paterson, W.A.M.S.

The subjects of examination were chosen, not only from amongst cases suffering from intestinal trouble, but also from cases undergoing surgical treatment, and normal healthy persons.

Of the 200 examinations made, 169 were positive and 31 negative, giving a percentage of 84·5 affected persons.

The following are the percentages affected by the different ova:—

Ankylostoma	...	...	...	...	...	49·5	per cent.
Trichocephalus dispar	...	...	...	...	...	34·5	„
Ascaris lumbricoides	...	...	...	...	...	29·5	„
Tænia	...	...	...	...	...	25·5	„
Strongyloides stercoralis	...	...	...	...	...	16	„
Schistosoma mansoni	...	...	...	...	...	15	„
Oxyuris vermicularis	...	...	...	...	...	1·5	„
Unknown eggs	...	...	...	...	...	1	„

Of these 62 were single infections.

„ 54 were double infections.

„ 37 were triple infections.

„ 13 were quadruple infections.

„ 2 were quintuple infections.

„ 1 was sextuple infection.

The most frequent single infection was *Ankylostoma*.

The most frequent double infection was

Tænia.

Ankylosotoma.

The most frequent triple infection was

Ascaris lumbricoides.

Ankylostoma.

Tricocephalus dispar.

The most frequent quadruple infection was

Ascaris lumbricoides.

Ankylostoma.

Tænia.

Tricocephalus dispar.

The most frequent quintuple infection was

Tricocephalus dispar.

Ankylostoma.

Tænia.

Ascaris lumbricoides.

Bilharzia.

And the sextuple infection was

Ascaris lumbricoides.
Strongyloides stercoralis.
Tricocephalus dispar.
Ankylostoma.
Tænia.
Bilharzia.

The percentage of those infected amongst the sick does not appear to be much higher than amongst the healthy, and it is extraordinary how little some of the natives who are heavily worm-infected show symptoms of harbouring these parasites.

The most interesting points brought out by these examinations were:—

Firstly, the large percentage of natives of the Nyanza Province infected with *ankylostomiasis*; and,

Secondly, the large percentage of sailors and fishermen who harbour the *lateral-spined bilharzia*. This latter, in some cases, gives rise to dysentery.

Of the 169 examined, 51 had never left the Nyanza Province, and of these 24 were *Jaluo*, 22 *Northern Kavirondo* (including Wamia, Nandi and Lumbwa) and 5 *Southern Kavirondo* (including Wakisii and Watende).

The numbers examined are too small to work out as percentages, but may serve as a basis for future investigations, so I append them:—

1. Amongst the *Jaluo* the infections were as follows:—

Ankylostoma	...	...	...	...	...	...	10
Ascaris lumbricoides	...	...	...	...	...	...	8
Tricocephalus dispar	...	...	...	...	...	...	9
Tænia	...	.....	...	...	...	...	6
Schistosoma mansoni	...	...	...	...	...	...	2
Oxyuris vermicularis	...	...	...	...	...	...	1
Strongyloides stercoralis	...	...	...	...	...	...	—
Negative	...	...	...	...	...	...	4
Unknown	...	...	...	...	...	...	—

2. Amongst the Northern Kavirondo the infections were:—

Ankylostoma	...	...	...	...	...	...	15
Ascaris lumbricoides	...	...	...	...	...	...	11
Tricocephalus dispar	...	...	...	...	...	...	8
Tænia	...	.....	...	...	...	...	6
Schistosoma mansoni	...	...	...	...	...	...	—
Oxyuris vermicularis	...	...	...	...	...	...	—
Strongyloides stercoralis	...	...	...	...	...	...	4
Negative	...	...	...	...	...	...	2
Unknown	...	...	...	...	...	...	1

3. Amongst the Southern Kavirondo the infections were:—

Ankylostoma	...	...	...	...	...	...	1
Ascaris lumbricoides	...	...	...	...	...	...	3
Tricocephalus dispar	...	...	...	...	...	...	5
Tænia	...	.....	...	...	...	...	—
Schistosoma mansoni	...	...	...	...	...	...	1
Oxyuris vermicularis	...	...	...	...	...	...	—
Strongyloides stercoralis	...	...	...	...	...	...	2
Negative	...	...	...	...	...	...	—
Unknown	...	...	...	...	...	...	—

For purposes of comparison with the figures of Dr. Shircore, who has already done numerous examinations of a similar nature at Mombasa, I have made out the following table.

Percentages of infections amongst tribes of whom upwards of 25 members were examined:—

Name of Tribe	Jaluo.	Northern Kavirondo.	Southern Kavirondo.	Buganda (Bunyoro and Busoga).
Number of individuals infected ...	89	33	—	26
Infection:—				
Ankylostoma	41	22	—	14
Ascaris lumbricoides	33	13	—	3
Tricocephalus dispar	36	11	—	8
Tænia	19	12	—	9
Schistosoma mansoni	13	2	—	8
Oxyuris vermicularis	1	—	—	1
Strongyloides stercoralis	9	4	—	5
Unknown	—	1	—	1
Negative	17	4	—	3
Single infection	25	8	—	8
Double „	23	11	—	6
Triple „	18	5	—	7
Quadruple „	4	4	—	2
Quintuple „	1	1	—	—
Sextuple „	1	—	—	—

Whilst carrying out these examinations I found *amæba coli* in three cases. These were from cases of acute dysentery. In 36 cases there were cysts, corresponding to *coli cysts*, when stained with iodine, and in one case corresponding to a *Hystolitica cyst*. These natives I look upon as “*dysentery carriers*,” and I am of opinion that, as soon as the Protectorate Service can afford to do so, these “carriers” should be as carefully segregated and freed from infection as “typhoid carriers,” as the death rate from dysentery in the Protectorate is very high indeed.

There were also 12 cases which showed a small, actively motile, flagellate, the pathogenicity of which I do not know. The organism was pear-shaped, with a single flagellum, corresponding to the stalk of the pear in position, and could just be made out with the low power.

NOTE.—With reference to the above the following figures extracted from returns kindly furnished me by Lieut.-Colonel Bligh-Wall, S.A.M.C., A.D.M.S., Carrier Corps, may be of interest as showing the incidence of what was found amongst the natives in military service.

Out of 282 post-mortems performed at Nairobi, a worm infection was found in 191 bodies=67 per cent.: *A. duodenale* in 12 per cent., tape worms in 48·5, and *A. lumbricoides* in 7 per cent. It must be remembered that there is the possibility that some of these cases may have been treated for worms and cleared.

A series of 600 examination of fæces made in the C.C. Laboratory gave a percentage of infection as follows:—*A. duodenale*, 18·8 per cent. ; *A. lumbricoides*, 7·5 per cent. ; tape worms, 7 per cent.; *T. dispar*, 5·5 per cent.; *A. stercoralis*, 5·3 per cent.; *S. mansoni*, 1 per cent.; Entamæba in 19·3 per cent. Tribes and multiple infections are not given.

Dr. Shircore, Medical Officer, Native Civil Hospital, Mombasa, in his annual report (1918) gives the following table as showing the distribution of worm infection amongst the two up-country tribes at the coast in the police force:—

Wa-Kavirondo—of 88 examinations made, 64 were positive=72·7 per cent.
 Wa-Kamba—of 28, 18=64·3 per cent.
 Miscellaneous tribes—of 30, 24=80 per cent.

The percentage distribution of the varieties amongst the tribes was as follows:—

	Kavirondo.	Kamba.	Miscellaneous.
A. duodendale	40·9	42·1	50
A. lumbricoides	27·2	17·8	13·3
T. trichiuris	15·9	10·7	26·6
T. saginata	26·1	32·1	10
S. mansoni	—	3·5	3·3

Of the total of 146 examinations, 106 were positive, giving an average infection of 71·2 per cent.

Dr. Kauntze, the bacteriologist, has a paper in preparation of the results of a 1,000 faecal examinations in the Carrier Corps. Out of a series of dysentery cases he found that the percentage infection of worms rose to 90 per cent., while in effectives and recruits the average was about 67 per cent.

APPENDIX II.

NOTES ON A CASE OF NERVOUS DISEASE.

BY DR. J. H. THOMSON

A strong, well-built Kikuyu adult of about twenty years of age was admitted into hospital on June 21st with a temperature of 105. No physical signs could be found to account for the temperature. The blood was normal. He was given an intra-muscular injection of quinine gr. X., also a purgative. The quinine injection was repeated daily for about five days.

Next day he complained of pain behind his right knee, and in the back thigh muscles of his right leg. When he walked he had an ataxic gait in his right leg. (The injection of quinine had been given in the left buttock.) On the 23rd he had well marked ataxia, and was quite unable to walk, spreading his legs in a vain attempt if supported. He was quite unable to stand unless held up by a person on each side. His mouth was twisting about continually. His knee jerks were slightly exaggerated, and he seemed to have hyperæsthesia over whole body; when in bed he lay perfectly still; all other reflexes were normal. Next day he was much worse. If held up and made to walk, seemed to be dancing, throwing his feet about in all directions. Four people could hardly hold him up; when inadvertantly let go he took one or two dancing steps forwards and fell heavily. His face twisted continually and his arms jerked about.

His appetite was good and his bowels regular. He had no incontinence. Temperature 102.

Next day, the 25th, all the symptoms had practically disappeared. He could walk and stand alone, but he was inclined to fall if walked more than a few yards. No temperature.

26th.—He is entirely normal except that he complained of pain in calves of legs.

He was discharged three days later cured, and walked ten miles to his home.

No previous history could be elicited. The case may have been a case of food poisoning.

APPENDIX III.

REPORT ON INFLUENZA EPIDEMIC, NAKURU, 1918.

BY DR. H. F. HAMILTON.

History.—The first cases appeared towards the end of September, and in the majority of cases were comparatively mild, and often diagnosed as bronchitis. There were, however, several cases of pneumonia following on influenza, including two in Europeans, of a severe type. During October, there were few cases to report, till the end of the month. In November, the whole of Nakuru seemed to go down at one time, and quickly the outbreak spread to the outlying farms. The epidemic raged for about three weeks severely, and then abated, owing apparently to the lack of fresh cases to attack. Outlying districts attacked later, ran the same course of three weeks. Both before and after the main epidemic the cases affected were of a milder type, with the exception of relapses.

The origin of the main epidemic was certainly from infection, which spread up the railway. The various stations were attacked in rotation, in a series of little jumps. Infection then spread to the outlying districts. Two main factors in the spread of the disease were:—

(1) The Police Decoration Parade at Nairobi, to which Police from all parts were gathered, were infected, and took back the disease to their own stations.

(2) The Red Cross celebrations, especially the Ball at the Stanley Hotel, Nairobi, which was attended from all parts of the country, and at which convalescents, and even people suffering from influenza were present.

The whole population was attacked. Natives, Goans and Indians went down almost to a man, owing to the very crowded mode of living, and to the lack of ventilation, and to the habit of spitting anywhere on the ground. Among Europeans there appeared to be about a 70% incidence. Those who escaped infection were those naturally immune to ordinary influenza attacks, and those who lived an open air life, and escaped any close contact with infected cases. It was remarkable that there was no case among the hospital staff, being constantly exposed to infection, and with three Indians on the staff. This must have been partially due to the excellent arrangements made by the Sub-Assistant Surgeon, who was in complete charge of the treatment of Natives and Indians. Women and children escaped infection more than men, and as a rule, were much lighter affected when attacked, though there were some bad cases of pneumonia among them. Men of spare frame escaped lighter than those of stouter build. Heavy drinkers suffered very severely. As in every epidemic, those run down in health suffered worse, and it is to the general low tone of the European health in British East Africa, owing to war conditions, and to the impossibility of proper leave, that I ascribe the severity of the epidemic in so sparsely settled a country.

Pathology.—The infection was undoubtedly a mucous membrane infection, starting in the naso-pharynx, and thence spreading down both the œsophagus and the air passages. As a general rule, the former was less affected, and intestinal affections were not marked. In one or two cases the intestinal symptoms predominated, and in practically every case œsophageal and gastric pain was a prominent symptom, and a diagnostic point of great value. In after treatment this had to be carefully borne in mind. However, the lung condition was the important one. Infection occurred in the larynx and the larger bronchi, and gravity appeared to be the most important element in its further spread. The first area of lung tissue affected was almost invariably a small patch just below the angle of the scapula, and situated in the upper part of the lower lobe. This was almost pathognomonic of this epidemic, and was associated with almost invariable symptoms to be detailed later. Later, in bad cases a diffuse broncho-pneumonia developed, and possibly spread to the other side. The upper lobes were seldom affected, and then late. Albuminuria developed fairly early, denoting the presence of an acute nephritis, which I understand has been borne out by microscopic examination.

The conjunctivæ were only mildly affected, and the eustachian tube mucous membrane in a small number of cases, with development of middle ear disease.

The blood coagulated very quickly. Blood counts revealed nothing special, the absence of any considerable leucocytosis pointing to the virulence of the epidemic.

The urine developed albumin in serious cases, and often in enormous quantities. This disappeared in most cases on convalescence.

The bacteriology of the epidemic, as worked out by Captain Gimlette, points to the important factor in the disease being a spirochæte especially where relapses occurred. Organisms found by him are as follows, cases being nearly all serious pneumonia ones:—

1. No obvious influenza bac.
2. Gram positive diplococci numerous in 80%.
3. Streptococci in 42%.
4. Staphylococci few.
5. *M. catarrhalis* in majority of cases.
6. Spirochætes in 44%.

Infection was a mixed one, the important elements being the pneumococcus, the streptococci and the spirochætes in my opinion. The latter certainly appears to be responsible for relapses, and for the persistent lung symptoms, and probably for the fact of the failure of any specific treatment. The characteristics of the spirochæte are described by Captain Gimlette in his report.

After the subsidence of the epidemic in the military camp, Nakuru, out of 14 cases showing persistent lung symptoms, 12 had spirochætes in their sputum in first examination.

Incubation Period was able to be ascertained in a few cases, and varied from 36 hours to 4 days. Symptoms during the period nil, and onset generally acute.

Symptoms and Course of Disease.—Patient feels suddenly weak, and temperature rises to 102, or thereabouts. Marked headache, and pains in back and limbs. A short, harsh, dry, irritating cough soon develops. Eyes suffused. Comparatively little coryza. Tongue very dirty all over, and flabby and indented; very dry and sticky. Pain in centre of chest, over lower part of sternum, is almost universal. Sore throat seldom causes much discomfort till later, and is more generally of the nature of a laryngitis. Pulse rapid, and soon shows signs of dicrotism and toxæmia; occasionally slow from the start in toxic cases. Pulse is best guide to progress, and the tongue is an excellent index of the toxæmia. Tenderness of epigastrium is often troublesome. Vomiting seldom severe.

Lung symptoms next develop. Captain Marshall, R.A.M.C., calls attention to a remarkably constant combination of symptoms. Upper lobe seldom early affected, save for a few coarse rales in the larger bronchi. Lower lobe is early attacked, almost invariably in a small patch just below the angle of the scapula; bronchial breathing is heard over this small area quite early, while lobe is often hyperresonant, later becoming dull with spread of inflammation. The other lobe generally shows marked absence of breath sounds, and diminished expansion, with diminution in resonance. (Difficult to explain this very constant sign in unaffected lobe). Front of lung, and upper lobes seldom show changes, except in cases of extensive involvement. Sputum is generally copious, and at first watery and lumpy. Next streaks of blood appear, and sputum becomes of more uniform consistence, with small frothy bubbles. Later, it often assumes a curious salmon colour. Occasionally it is actually purulent in the later stages of a bad case.

Sweating at times profuse during the first day or two. Later skin becomes hot, dry and inactive. In convalescent stage often very profuse sweats.

Toxic symptoms develop early:—Coated, foul tongue, and sordes in mouth. Dicrotic, irregular and feeble pulse. Albuminuria becomes very marked. Prostration and marked after-effects following on the slightest exertion. Delirium in many cases, associated with restlessness and sleeplessness.

The broncho-pneumonic stage is not sharply defined, and cases really vary only in extent of affection, as the lung is apparently affected after the first day in most patients. Spread is largely to dependent parts, and is markedly influenced by gravity.

For the first two days temperature remained between 102 and 103, and condition approximates very closely to a typical influenza attack. Pains and cough distressing, and marked prostration. On the third day, symptoms were alleviated, and in a favourable case abated, till normal was reached in another couple of days. In unfavourable circumstances, a definite broncho-pneumonia developed the third or fourth day, and ran the course of a severe, toxic form. Generally, convalescence was heralded by an indefinite crisis, after which, in severe cases the patient might run a low temperature for several days. Increase in diet here helped the return to normal). The onset of broncho-pneumonia was almost always associated with some indiscretion of patient during the interval of improvement, or with failure of nursing in the initial stages of the disease. Cases were wonderfully suggestive of Yellow Fever, except that lung

symptoms predominated, instead of intestinal. In the few intestinal cases vomiting and diarrhœa were persistent for a few days, but did not cause any anxiety. A curious salmon-coloured diarrhœa, similar to the sputum already described, was noted in a number of cases. Tenderness over epigastrium often persisted for a considerable time, and with the laryngitis was often very distressing to patients. Neuralgia and earache were occasionally severe.

Complications noted were neuralgia, delirium tremens, otitis media and jaundice. The latter was rather a complication of convalescence, and was always late in appearing. Relapses were often severe in type. Meningitis developed in one case; abscess of the lung in another.

The after-course points to the very toxic nature of the disease, convalescence is very prolonged, and patient is easily tired and depressed. Depression may go to the length of melancholia. Heart sounds reduplicated. The initial lung patch is often traceable for weeks and months after, and it is especially in these cases that a persistent spirochæte is found. Appetite is poor, and ordinary tonics of little value.

Prognosis depends largely on state of general health, previous alcoholic indulgence, and most of all to correct nursing from the start. Women and children, prognosis good. Indians were bad cases, owing to their dislike of fresh air, frequent refusal to take medicines, and a mania for travelling when ill. The natives did not seem to suffer more than the Europeans, and when care was taken of them some wonderful results were obtained. In one instance no deaths occurred in 150 cases, while a few miles away 8 deaths were recorded in 35 cases. Stout men suffered worse.

Treatment.—A circular was sent to every outstation advising methods of treatment and giving prescriptions recommended.

Prophylaxis.—*General*.—Avoid all crowds, and prohibit public meetings. Lay dust in streets and houses by copious sprinkling. Keep windows and doors open day and night, and live in open air as much as possible. Avoid needless exposure to infection. Those exposed to infection as nurses, should have temperature taken three times daily, so as to allow of early treatment.

Drugs of little value. Quinine I have not found of much use, and the experience of the convalescent camp at Nakuru, where every man was taking quinine, demonstrated no preventative qualities. Smelling of camphor and eucalyptus oil, of little or no use, but it was found very valuable in natives to encourage constant chewing of eucalyptus leaves. In other cases, application of weak menthol ointment inside nostrils appeared efficacious as a prophylactic.

Most efficacious of all is douching of nose and throat with very mild antiseptics, or with saline, three or four times daily, and keeping teeth and mouth clean.

Treatment of Natives on a large scale.—Lack of drugs and of attendants cause treatment of natives in bulk, on farms, etc., to be very difficult. The aim will be to get the maximum benefit at least cost, and probably medicine only once daily.

The best results came from the following treatment:—

A. *Stop all work.*

B. *Drugs.*

1. Kerosene oil one teaspoonful to one tablespoonful in milk every other day.
2. Liniment camphor ammon minims 15 in milk daily or oftener (can be made up in bulk easily every day by adding a large tablespoon of the liniment to the pint of milk. Dose, one tablespoon).
3. Encourage chewing of eucalyptus leaves.
4. Salts as required.
5. A bottle of pneumonia mixture (Pot. Iodide and citrate) for bad cases.

Treatment.—1. Maximum amount of fresh air. Move patient early into best room in house, and keep windows open day and night.

2. *Absolute rest in bed from the first.* Best treated by allowing only a single pillow. A feeding cup, bed pan and urine bottle are essentials from the first. Patient should be helped in every movement to avoid strain on heart.

Specially warn patient not to get up or sit up when interval improvements starts on third day. Keep absolutely in bed for two days after ordinary attack and for four or seven days after broncho-pneumonia.

3. *Eliminate toxins.*—(a) Calomel and salts at onset. Afterwards be guided by condition of patient. Mild saline every day or two beneficial, unless condition critical.

(b) Act on skin. Diaphoretics are dangerous and must be carefully watched. Aspirin I consider most dangerous, and should only be used on initial day, if at all. A combination of phenacetin and sodium salicylate is more efficacious and far less depressing, and is very valuable for first two days in robust patients. A hot pack stimulates skin and kidneys and is preferable to drugs, but requires a skilled nurse and assistant and long mackintosh sheeting—often an impossible combination. Intravenous salines or tonic serum are invaluable in eliminating toxins.

(c) *Act of kidneys.*—Patient should be encouraged to drink fluids as much as possible. The stomach is generally inflamed, and even milk may not be tolerated. Ring the changes on water, barley and rice water. All can with advantage be flavoured with lemon or orange. Tea and soup are both excellent. Aim to drink at least half-a-gallon a day. A mixture of soda bicarb and soda citrate is invaluable, and should be drunk diluted in the water, as taste is not unpleasant. The citrate relieves the very marked tendency of the blood to coagulate, and the bicarb aids in eliminating toxins, tends to neutralise them and increases alkalinity of blood.

4. *Keep up strength of heart.*—In early stages no alcohol is required. Later, if broncho-pneumonia develops, brandy in milk or by itself is of value, but champagne is better and does not hinder toxin elimination by any actions on kidney. In one severe case gin was found very useful.

The most constantly useful drug is camphor in camphor, or in camphor amon. hypd. inject, i.c.c., every 2 to 4 hours. or by the mouth, mixed in milk.

Strophantin and digitalis are both useful. Digitalis action in increasing urine secretion is of value.

5. *Specific and Symptoms.*—In a mixed infection such as this, no treatment can be regarded as specific. I have found best results from pot. iodide in small doses given frequently, combined with citrates. This is partially specific, as pot. iodide in my opinion acts directly on the pneumococcus, while it is the only drug of proved value against spirochaetes. Another possible specific for the spirochaeta, but could only be given early, on account of the nephritis, is galyl intravenously.

In one case of galyl given early, the pneumonia lasted three days only and never caused the slightest anxiety, though the patient had been recently invalided from the military for repeated severe malaria and anaemia.

Expectorant mixtures are indicated and a very good medium is an oily one, as it appears to sooth the inflamed mucous membrane. Tr benz co. is very valuable, both in a mixture and as an inhalation for laryngitis.

Bromides are invaluable and combine well with the iodides, and does not appear to be depressant to any extent. Sleeplessness and restlessness may call for repeated large doses. Other hypnotics, as hyoscine, may be required.

Poultices often relieve the hacking cough and give sleep. Morphia I have not found safe to give owing to its action on the kidneys. The inhibition of secretion is also a great drawback to its use.

6. *After treatment.* Gastric catarrh prevents use of any of the more accustomed tonics without preliminary treatment. A nux vomica and gentian mixture is the best to start with. Hypophosphates and glycerophosphates are very soon tolerated. An injection of galyl is often invaluable, especially in the depressed cases. I find the best treatment is an injection of 20 cgrm., and repeat if necessary in a month's time. Too large an injection upsets digestion, and also acts as a cerebral irritant.

The best results have appeared in cases that are out of doors all day, but without any very hard exercise.

Feed up with milk, cream, eggs, etc. Avoid all strain for a couple of months. and if spirochætes remain in sputum, be very careful of relapses and continue with iodides.

STATISTICS.

The figures given are very fallacious. Hospital cases are necessarily serious cases only. Out-patients came in such numbers that it was physically impossible, with the very small staff to record all their names. A large number of deaths occurred in those who never came for treatment, and there is no record kept of such cases.

Of the European deaths, no civilian resident in Nakuru died, though there was a death in each of the main outlying districts. Such cases were at the most only seen once or twice and had no provision for adequate nursing. The supply of bedpans and feeding cups was hopelessly inadequate, and could only be issued to serious cases, thus allowing ample material for the production of fresh serious cases.

Medicine and advice supplied to district farms and estates, but no records obtainable of such cases.

TOTALS.

Town.	Race.	Influenza.	Pneumonia.	Total.	Deaths.	Remarks.
Naivasha ...	Europeans	23	2	25	2	1 death, Naivasha, and 1, Gilgil.
	Asiatics ...	47	7	54	4	October cases, 11. Deaths, nil.
	Africans...	151	16	167	10	November ,, 235. ,, 16.
Eldama Ravine	Europeans	22	—	22	1	1 death, Londiani.
	Asiatics ...	25	—	25	3	October cases, 32. Deaths, 1.
	Africans...	462	—	462	31	November ,, 477. ,, 34.
Eldoret ...	Europeans	77	—	77	7	November cases, 231. Deaths, 9.
	Asiatics ...	14	—	14	—	December ,, 73. ,, 5.
	Africans...	213	—	213	7	
Nakuru ...	Europeans	101	24	125	3	*September cases, 38. Deaths, 2.
	Asiatics }	692	123	815	37	October ,, 127. ,, 6.
	Indians }					November ,, 739. ,, 32.
						December ,, 36. ,, —
						*1 death at Molo ; 1, Rongai ; 1, Elementeita.
Kabarnet ...	—	80	—	80	3	

Total death-rate=5%.

APPENDIX IV.

NAIROBI,

21st November, 1918.

TO ALL MEDICAL OFFICERS, E.A.P.

CIRCULAR RE INFLUENZA.

The following general remarks in connection with the outbreak of influenza in this Protectorate are forwarded for favour of transmission to the Provincial Commissioners and District Commissioners within your sphere, together with such further observations as you may wish to add.

I. It is presumed that there is a general acquaintance with the symptoms which betoken the presence of the disease and an appreciation of the fact that complications are possible.

II. *Anent Europeans (a).* As regards precautionary measure against the disease, the avoidance of persons suffering from it, the frequent gargling of the throat (with solutions such as Permanganate of Potash (half a grain to the pint), Chlorate of Potash (five grains to the ounce), Borax (ten grains to the ounce) etc.), the taking of small doses of quinine (two grains) morning and evening, the keeping of one's dwelling well ventilated, and the living of a quiet life, keeping as much in the open air as possible are useful practices.

(b) When an individual is attacked by the disease he should immediately go to bed and stay there until *completely* well. His nursing and feeding should be arranged for. His diet should be light and nourishing (*e.g.*, milk, soups, custards, gruel, and, if necessary, egg flips). He should take a purge at the onset of his illness and, subsequently, two grains of quinine three times a day. Sore throat may be treated with one of the gargles mentioned above or other suitable one, headache and neuralgias with discreetly taken doses of aspirin, and other troublesome symptoms by appropriate remedies.

Stimulants should be given in measured quantities and at definite times if the weakness of the patient indicates that such are required.

In the event of chest or other complications supervening further advice should be sought.

III. *Anent Non-Europeans.* As regards precautions against the disease and curative measures when individuals are attacked by it the details given in II. (a) and (b) above in respect of medicines to be used can be given effect to as far as practicable. The administration of one teaspoonful of paraffin oil three times a day has been spoken of as having good results where administered to Africans suffering from this disease. As regards the dieting of the sick, milk, uji of wimbe, mtama, or mahindi, and such like foods should be given at frequent intervals. Patients attacked by the disease should go to bed and remain there until *completely well*, and *persons should be detailed to look after and to feed them.*

IV. It is to be remembered that persons who have recovered from this disease remain weak for some time subsequently. They should, therefore, resume the routine of their every-day life but slowly, and rebuild their strength with nourishing food. The feeling of depression which is experienced during convalescence may be overcome by means of a tonic.

APPENDIX V.

NAKURU,
26th March, 1919.

From M.O., NAKURU,
To P.M.O., NAIROBI.

Sir,

I have the honour to forward the following report as to what I consider would be the most useful type of Field Ambulance for this country:—

A.—The ambulance should be a fifty-bedded unit, with the following personnel:—

Rank.	Number.
Medical Officers	2
Sergeant, R.A.M.C.	1
Sergeant, Transport	1
European Ward Orderlies	4
Storekeeper (either European or educated native)	1
*Writer or Clerk	1
Dressers, A.N.M.C.	6
Dhobies	2
Sweepers	3
Water carriers	4
Cooks	2
Syces	2
Stretcher bearers	100

Porters—

Medical officers' (3 each)	6
Sergeants' (2 each)	4
Ward orderlies' (2 each)	8
Storekeepers (for books, etc.)	1
Writer's	1
To carry hospital tents	12
„ „ 80 lbs. tents	8
„ „ 'Paulins	12
„ „ Rations	10
„ „ Camp beds and blankets	6
„ „ Ambulance boxes (full)	20
„ „ 5 spare boxes (empty)	1
„ „ Lamp	1
„ „ Operating table	1
„ „ 8 pakhals, half full	8
„ „ 1 tin oil	1
„ „ 1 Japanese pattern water steriliser	1
„ „ 20 latrine tins	1
„ „ 2 latrine tents	2
„ „ 1 flag-staff and two flags (Red Cross and Union Jack)	1
10 per cent. square	11
Total	124

**Re* writer, an allowance might be given to one of the Ward orderlies to perform this duty, or a native clerk might be employed.

B.—TENTAGE.

- 3 Hospital tents, double-fly, strong green canvas, to take 4 beds each, for Europeans.
- 2 M.O.'s tents, 80 lbs. each.
- 1 Sergeants' tent, 80 lbs. each.
- 2 Ward Orderlies' tents, 80 lbs. each.
- 1 extra hospital tent for operations, dispensary or office work, as might be required.
- 12 'paulins, size 10 by 20 ft.
- 25 stretcher-bearer tents (to be carried by the S.B.'s).
- 2 latrine tents.

C.—BOXES (20).—*These should be regulation Red Cross chop-boxes, and should contain:—*

1.—*Stationery, viz.:—*

- 3 A. and D. books.
- 1 Prayer Book.
- Field Service Manual, parts I. and II.
- „ „ Regulations, parts I. and II.
- 36 envelopes, small.
- 36 „ „ large.
- 5 quires foolscap paper.
- 1 gum-bottle, with screw top and brush (full).
- 2 sheets poison labels.
- 1 nail brush.
- 1 lb. candles.
- 1 packet matches.
- 1 strop.
- 4 Field Service pocket books, and 4 refills.
- 1 dozen paper clips.
- India rubber.
- 20 pencils (12 black, 6 indelible, and one each red and blue).
- 2 penknives.
- 1 packet pins.
- 1 ball string.
- 1 set of stencil.
- 2 tablets of soap.
- 4 sticks of sealing wax.
- A supply of such Forms as may be in use (for example, A36, A34, War Diary, etc., etc.).
- 2 telegraph pads.
- Blotting paper.
- Carbon paper.
- 1 tube ink powder.
- Pens and assorted nibs.

Box II.—*Necessary apparatus for Microscopic work, viz.:—*

- Microscope, in box, with cedar oil.
- Leishman's stain.
- Giemsa „ „
- Methylene blue.
- Carbol Fuchsia.
- Spirit lamp.
- Platinum needles (2):
- Box of slides.
- „ „ cover-slips.
- Xylol.
- Sulphuric acid (25 per cent. solution).
- Absolute alcohol.

Box III.

- Motor lamp and supply of carbide.

Box IV.

- Steriliser and Primus Stove.

*BOXES V. & VI.

- Cotton wool.

*BOXES VII. & VIII.

- Bandages.

*Box IX.

- Gauze.

*Box X.

- Lint (Boric and plain) and 1 sheet Poroplast.

* The following *Splints* to be tied to these six boxes:—

- 10 long Liston splints
- 6 Angle „
- 6 Carr's „
- 20 Assorted „

Box XI.—*Tools.*

2 saws.
 1 hammer.
 1 screw-driver.
 1 pincers.
 1 tape measure.
 1 file.
 1 adze.
 2 lbs. assorted nails.
 1 lb. assorted screws.
 1 rule.
 6 pangas.
 Match-boarding.
 2 gimlets.

Box XII.—*Medical Comforts (a, b and c).*

(a) 6 bottles brandy.
 Corkscrew and tin opener.
 6 lbs. sago.

Box XIII.

(b) 6 bottles champagne.
 1 pair wire cutters.
 6 lbs. Bovril and other meat essences.

Box XIV.

(c) Condensed milk.

Box XV.

6 hand towels.
 1 operating sheet.
 White American cloth (waterproof) 6 ft. by 6 ft.
 Americani (reserve) $\frac{1}{4}$ bale.
 1 large enamel instrument tray.
 1 small enamel instrument tray.
 3 kidney trays.
 2 large lotion bowls.
 2 small lotion bowls.

Box XVI.—*Culinary apparatus (Europeans).*

Cooking pots (1 nest).
 2 feeding cups.
 12 mugs.
 12 spoons.
 12 knives.
 12 forks.
 12 plates.
 1 enamel teapot.

Box XVII.—*Culinary apparatus (Africans).*

Cooking pots (1 nest).
 2 feeding cups.
 12 mugs.
 12 spoons.
 12 enamel soup-plates.

Box XVIII.—*Spare clothing.*

4 pairs pyjamas.
 12 shirts.
 12 pairs shorts.

Box XIX.—*Instruments.*

Major surgical instrument case (new Army pattern).
 Minor " " " "
 1 small text book of surgical operations.
 4 hypodermic syringes (Army pattern or Record).

Box XX.—*Drugs.*

- 10 lbs. quinine.
- Assorted hypodermic tablets.
- 2 lbs. bismuth tablets.
- $\frac{1}{2}$ lb. tinct opii tablets.
- 2 lbs. Iron and Arsenic Co. tablets
- 1 lb. Dover's powder tablets.
- $\frac{1}{2}$ lb. ipecac and scillæ tablets.
- 2 lbs. vaseline.
- 1 pint cyllin, lysol.
- $\frac{1}{2}$ lb. carbolic acid.
- 1,000 corrosive sublimate tablets.
- 5 lbs. magnesium sulphate.
- 2 lbs. castor oil.

Other Articles.

- 1 tin oil for lamps.
- 8 pakhsals.
- 1 Japanese pattern Field Water-Steriliser.
- 1 camp table and chair.
- 12 beds.
- 50 blankets.
- 2 days' rations.
- 1 iron operating table.
- 12 Dietz lamps (to be carried strung on a pole).
- 20 latrine tins.

This report is, of necessity, somewhat incomplete as I am not at present in possession of the data concerning weights, etc., of equipments which would enable me to apportion loads, etc., with accuracy.

During February and March, 1918, however, when working at Headquarters, I drew up lists of equipment for Field Ambulances and Hospitals, minute to the smallest detail, together with plans of buildings, etc., for the proposed K.A.R. Medical Service. These plans, to the best of my knowledge, are still in possession of the A.D.M.S., K.A. Rifles.

The list of *medical* comforts may, at first sight, seem excessive, but I have not found it so in practice. It is very rare indeed for patients coming into an ambulance to bring their day's rations (wounded collected after an action, of course, cannot do so), and, as they must be fed, the deficit has to be made up from "hospital comforts" and the Medical Officer must foresee this contingency and provide for it.

I have included *12 folding camp beds* for possible European cases, as these are always liable to occur, and the value of the beds in such contingencies amply repays the extra weight of equipment involved.

The system of numbered chop-boxes, with the list of contents marked clearly on the lid is infinitely preferable to that of mule-panniers, etc., in vogue among the British and Indian sections, as, in this country, where warfare is chiefly carried on in the bush, and porter transport is more often used than either animal or mechanical, the small, self-contained boxes, which make one load a-piece, form far the most practical method of transporting the equipment.

Equipment of personnel.—The *stretcher bearers* should each be equipped with one blanket, one water-bottle, one panga, in sheath, a blue jersey, with a red cross on a white ground on the chest, blue shorts, blue putties, a blue flat tarboosh and a haversack.

Ordinary field stretchers should be used. Wheeled stretchers have *not* proved advantageous in this country. The bearers should have *4 Headmen*, and the remaining 96 should be divided into *20 stretcher squads of four bearers each*, 16 being reserved as spare bearers in case of need.

The porters should be equipped with *grey* jerseys and shorts and be supplied with one blanket, one water bottle and one haversack each. Each *dresser* should be equipped with a uniform similar to that worn by stretcher bearers and be supplied, in addition to the usual articles, with a *Field Surgical Haversack*.

The *water-carriers* should each carry a large sized water-bottle and cup of approved pattern, preferably of the type supplied to the Indian Ambulances.

Each *European Ward Orderly* should carry an *Army Pill case* for emergencies.

Each *Sweeper* should carry an enamelled iron bed-pan and urinal in a canvas case.

For the purpose of collecting wounded the bearers would split up into 4 squads, each under the direct control of a European Ward Orderly. Each squad would consist of:—

- 1 European Ward Orderly.
- 1 Native dresser.
- 1 Water carrier.
- 5 stretchers with 4 bearers each.
- 1 Neapara, and
- 4 spare extra bearers in case of need.

The establishment that I advocate for a field ambulance is not the same as that of the three E.A.F.A. When I handed over three E.A.F.A. our establishment was as follows:—

	1918.	1914.
Medical Officer	1	1
Sub-Assistant Surgeon	1	1
Sergeant	1	1
British N. Orderlies	3 N.C.O's.	—
Cooks, Hindu	1	1
„ African	1	1
Writer (Indian)	1	—
Sweeper (Indian)	1	2
P. Store Havildar	1	1
Storekeeper (Indian)	1	—
Water-carriers	2	2
Syces	2	—
Dressers	4	2
Stretcher bearers	100	60
Porters	98	—

N. P. JEWELL, M.D.,

Medical Officer.

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